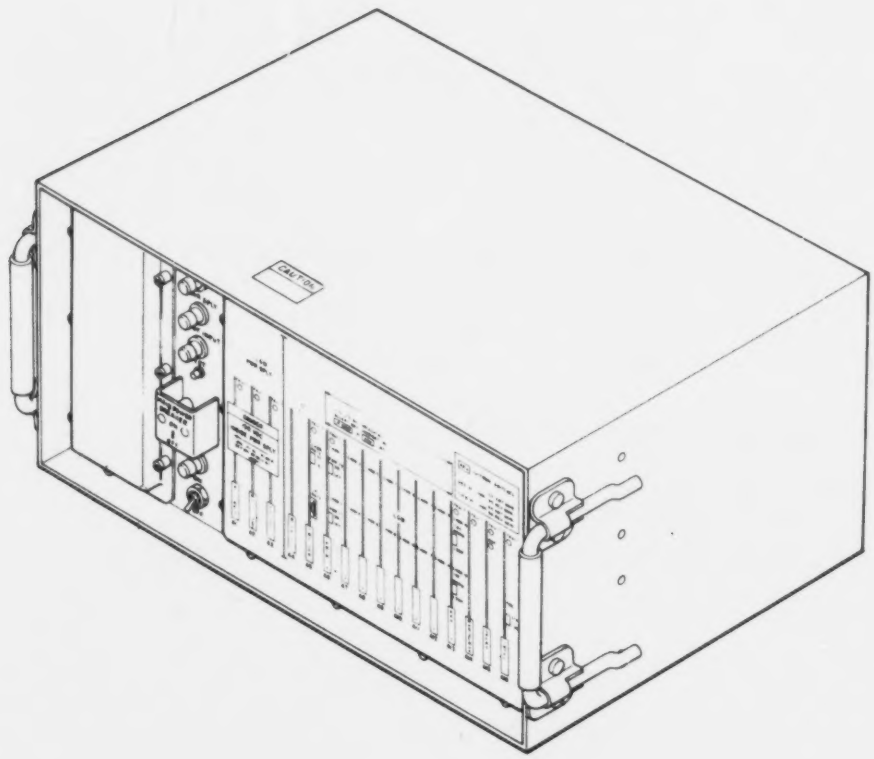
11-5805-696-12

ARMY TM 11-5805-696-12
NAVY EE163-EG-OMI-010/E154 TD1235
AIR FORCE TO 31W2-2TTC-31
MARINE CORPS TM 5805-12/1

OPERATOR'S AND ORGANIZATIONAL MAINTENANCE MANUAL



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MULTIPLEXER

TD-1235(P)/TTC

(NSN 5820-01-145-2460)

DEPARTMENTS OF THE ARMY, THE NAVY, THE AIR FORCE, AND THE MARINE CORPS

17 SEPTEMBER 1984

D 101.11:

READEX MICRO

best copy available

5 SAFETY STEPS TO FOLLOW IF SOMEONE IS THE VICTIM OF ELECTRICAL SHOCK

1. DO NOT TRY TO PULL OR GRAB THE INDIVIDUAL

2. IF POSSIBLE, TURN OFF THE ELECTRICAL POWER

3. IF YOU CANNOT TURN OFF THE ELECTRICAL POWER, PULL, PUSH, OR LIFT THE PERSON TO SAFETY USING A WOODEN POLE OR A ROPE OR SOME OTHER INSULATING MATERIAL

4. SEND FOR HELP AS SOON AS POSSIBLE

5. AFTER THE INJURED PERSON IS FREE OF CONTACT WITH THE SOURCE OF ELECTRICAL SHOCK, MOVE THE PERSON A SHORT DISTANCE AWAY AND IMMEDIATELY START ARTIFICIAL RESUSCITATION

HIGH VOLTAGE

The high voltage used in this equipment can kill on contact. Observe the following safety precautions:

- **Ground the Equipment** — Before connecting primary power or the signal cables, connect a heavy gage copper wire from the ground lug on the rear panel to earth ground. Do not remove this wire until the signal cables and primary power have been disconnected.
- **Avoid the Power Input** — Be careful not to contact the 115-volt ac input connections when installing or servicing the equipment.
- **Do Not Service Alone** — Never work on the equipment unless there is another person nearby who is familiar with the operation and hazards of the equipment and who can administer first aid.
- **Use One Hand** — Where possible, use only one hand to service the equipment. Keep the other hand away to reduce the hazard of current flowing through the vital organs of the body.

CLEANING SOLVENT

The fumes of trichlorotrifluoroethane used for cleaning this equipment can cause severe irritation or injury. Observe the following safety precautions:

- **Ventilate** — Use only outside or in well ventilated areas and avoid breathing the fumes.
- **No Smoking** — Do not smoke while using and do not use near an open flame or hot surface. Trichlorotrifluoroethane does not burn but heat converts the fumes to a toxic, irritating gas.
- **Use Gloves** — Use gloves that trichlorotrifluoroethane can't penetrate. Because the solvent dissolves the natural oils, avoid long or repeated contact with your skin.
- **Wash** — Wash hands immediately after using.
- **Do Not Take Internally** — Do not drink. If taken internally, see a doctor immediately.

HEAVY EQUIPMENT

This equipment weighs over 35 pounds and can cause serious injury if lifted or carried alone. Observe the following safety precaution:

- **Do Not Lift or Carry Alone** — Do not attempt to lift, carry, or move the equipment by yourself — get help.

LIST OF EFFECTIVE PAGES

INSERT LATEST CHANGED PAGES, DESTROY SUPERSEDED PAGES.

NOTE: The portion of the text affected by the changes is indicated by a vertical line in the outer margins of the page. Changes to illustrations are indicated by miniature pointing hands. Changes to wiring diagrams are indicated by shaded areas.

DATES OF ISSUE for original and changed pages are:

Original .. 0 ... 17 September 1984

TOTAL NUMBER OF PAGES in this publication is 120 consisting of the following:

Page No.	Change No.*
A, B, C	0
D Blank	0
iv Blank	0
1-1 - 1-21	0
1-22 Blank	0
2-1 - 2-23	0
2-24 Blank	0
3-1	0
3-2 Blank	0
4-1 - 4-27	0
4-28 Blank	0
A-1 - A-2	0
B-1 - B-9	0
B-10 Blank	0
C-1 - C-3	0
C-4 Blank	0
D-1	0
D-2 Blank	0
E-1 - E-2	0
GLOSSARY-1 - GLOSSARY-2	0
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Forms (8)	0

*Zero in this column indicates an original page.

TM 11-5805-696-12
EE163-EG-OMI-010/E154 TD1235
TO 31W2-2TTC-31
TM 5805-12/1

Technical Manual
No. 11-5805-696-12
Technical Manual
EE163-EG-OMI-010/E154 TD1235
Technical Order
No. 31W2-2TTC-31
Technical Manual
No. 5805-12/1

DEPARTMENTS OF THE ARMY,
THE NAVY, THE AIR FORCE
AND THE MARINE CORPS

Washington, DC, 17 September 1984

OPERATOR'S AND ORGANIZATIONAL MAINTENANCE MANUAL
MULTIPLEXER TD-1235 (P)/TTC
(NSN 5820-01-145-2460)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in back of this manual direct to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: DRSEL-ME-MP, Fort Monmouth, New Jersey 07703-5007.

For Air Force, submit AFTO Form 22 (Technical Order System Publication Improvement Report and Reply) in accordance with paragraph 6-5, Section VI, TO 00-5-1. Forward direct to prime ALC/MST.

For Navy, mail comments to the Commander, Naval Electronics System Command, ATTN: ELEX 8122, Washington, DC 20360.

Marine Corps Units should submit NAVMC10772.

In either case, a reply will be furnished direct to you.

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HOW TO USE THIS MANUAL

This manual tells you how to operate and maintain Multiplexer TD-1235(P)/TTC.

Step-by-step procedures with illustrations give you all the necessary information to install, operate, and maintain this equipment at an organizational level. However, do not attempt any procedure before you first familiarize yourself with the entire procedure.

If you are looking for general information, use the table of contents in the front of this book to locate chapters and sections containing this information.

If you are looking for specific information, use the subject index in front of each chapter to locate the paragraph and page where the topic is discussed.

CHAPTER 1
INTRODUCTION

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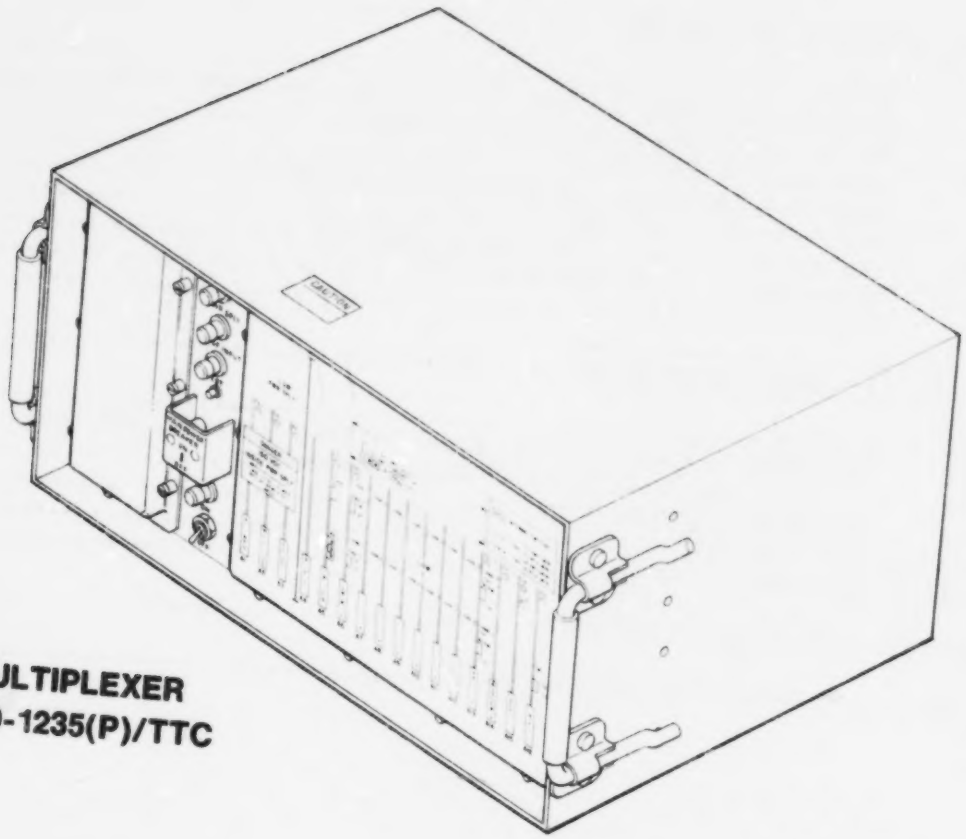
Section I. GENERAL INFORMATION



MULTIPLEXER TD-1235(P)/TTC

EL1US001

1-1. SCOPE

This manual provides general description, operation, and operator and/or organizational maintenance instructions for Multiplexer TD-1235(P)/TTC. Multiplexer TD-1235(P)/TTC is referred to in this manual as the LGM (Loop Group Multiplexer).

1-2. CONSOLIDATED INDEX OF ARMY PUBLICATIONS AND BLANK FORMS

Refer to the latest issue of DA Pam 310-1 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

1-3. MAINTENANCE FORMS, RECORDS, AND REPORTS

a. Reports of Maintenance and Unsatisfactory Equipment. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750 as contained in Maintenance Management Update. Air Force personnel will use AFR 66-1 for maintenance reporting and TO-00-35D54 for unsatisfactory equipment reporting. Navy personnel will report maintenance performed using the Maintenance Data Collection Subsystem (MDCS) in accordance with OPNAVINST 4790.2, Volume 3, and unsatisfactory material conditions (UR submissions) in accordance with OPNAVINST 4790.2, Volume 2, Chapter 17.

REPORT OF DISCREPANCY (ROD)

1. DATE OF PREPARATION | 2. REPORT NUMBER

☐ SHIPPING ☐ PACKAGING

3. TO (Name and address, include ZIP Code) | 4. FROM (Name and address, include ZIP Code)

5a. SHIPPER'S NAME | 5b. NUMBER AND DATE OF INVOICE | 6. TRANSPORTATION DOCUMENT NUMBER (GBL, Waybill, TCN, etc.)

7a. SHIPPER'S NUMBER (Purchase Order/Shipment, Contract, etc.) | 7b. OFFICE ADMINISTERING CONTRACT | 8. REQUISITIONER'S NUMBER (Requisition, Purchase Request, etc.)

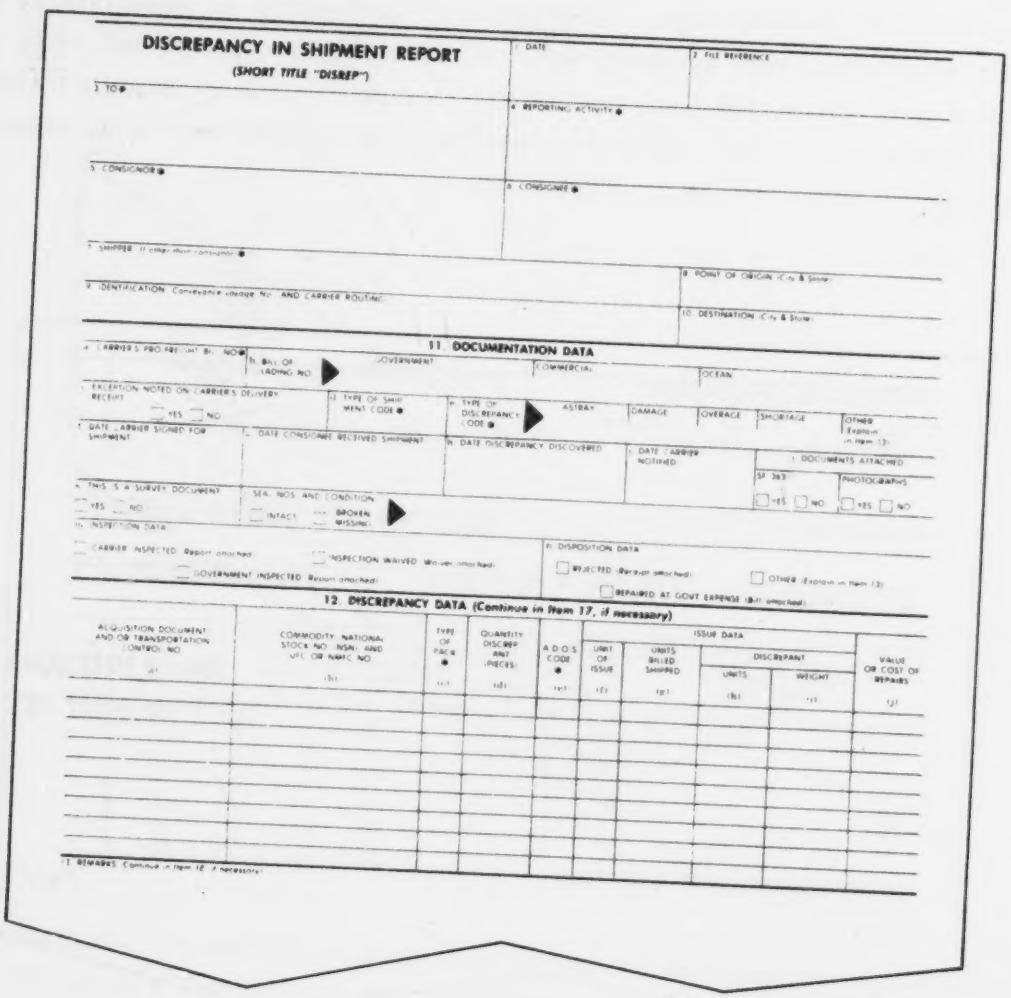
9 SHIPMENT, BILLING, AND RECEIPT DATA				10 DISCREPANCY DATA				11
NSN/PART NUMBER AND NOMENCLATURE (a)	UNIT OF ISSUE (b)	QUANTITY SHIPPED/ BILLED (c)	QUANTITY RECEIVED (d)	QUANTITY (a)	UNIT PRICE (b)	TOTAL COST (c)	CODE[1] (d)	ACTION CODE[2]

12. REMARKS (Continue on separate sheet of paper if necessary)

EL1US002

b. Report of Packaging and Handling Deficiencies. Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-11-2/DLAR 4140.55/NAVMATINST 4355.73A/AFR 400-54/MCO 4430.3F.

1-3. MAINTENANCE FORMS, RECORDS, AND REPORTS—Continued



DISCREPANCY IN SHIPMENT REPORT
(SHORT TITLE "DISREP")

1. DATE
2. FILE REFERENCE
3. TO
4. REPORTING ACTIVITY
5. CONSIGNOR
6. CONSIGNEE
7. SHIPPER
8. POINT OF ORIGIN (City & State)
9. IDENTIFICATION (Commercial invoice No. AND CARRIER ROUTING)
10. DESTINATION (City & State)

11. DOCUMENTATION DATA

a. CARRIER'S PRO REFERENCE BL. NO.
b. BILL OF LADING NO. — GOVERNMENT / COMMERCIAL / OCEAN
c. EXCEPTION NOTED ON CARRIER'S DELIVERY RECEIPT — YES / NO
d. TYPE OF SHIPMENT CODE
e. TYPE OF DISCREPANCY CODE — ASTRAY / DAMAGE / OVERAGE / SHORTAGE / OTHER (Explain in Item 13)
f. DATE CARRIER SIGNED FOR SHIPMENT
g. DATE CONSIGNEE RECEIVED SHIPMENT
h. DATE DISCREPANCY DISCOVERED
i. DATE CARRIER NOTIFIED
j. DOCUMENTS ATTACHED — SF 361 YES / NO; PHOTOGRAPHS YES / NO
k. THIS IS A SURVEY DOCUMENT — YES / NO
SEA. NOS. AND CONDITION — INTACT / BROKEN / MISSING
m. INSPECTION DATA
CARRIER INSPECTED (Report attached) / INSPECTION WAIVED (Waiver attached)
GOVERNMENT INSPECTED (Report attached)
n. DISPOSITION DATA
REJECTED (Receipt attached) / OTHER (Explain in Item 13)
REPAIRED AT GOVT EXPENSE (Bill attached)

12. DISCREPANCY DATA (Continue in Item 17, if necessary)

ACQUISITION DOCUMENT AND OR TRANSPORTATION CONTROL NO (a)	COMMODITY, NATIONAL STOCK NO, NSN, AND U/I, OR NAMC NO (b)	TYPE OF PACK (c)	QUANTITY DISCREPANT (PIECES) (d)	A.D.O.S. CODE (e)	ISSUE DATA: UNIT OF ISSUE (f)	ISSUE DATA: UNITS BILLED SHIPPED (g)	DISCREPANT: UNITS (h)	DISCREPANT: WEIGHT (i)	VALUE OF COST OF REPAIRS (j)

17. REMARKS (Continue in Item 12, if necessary)

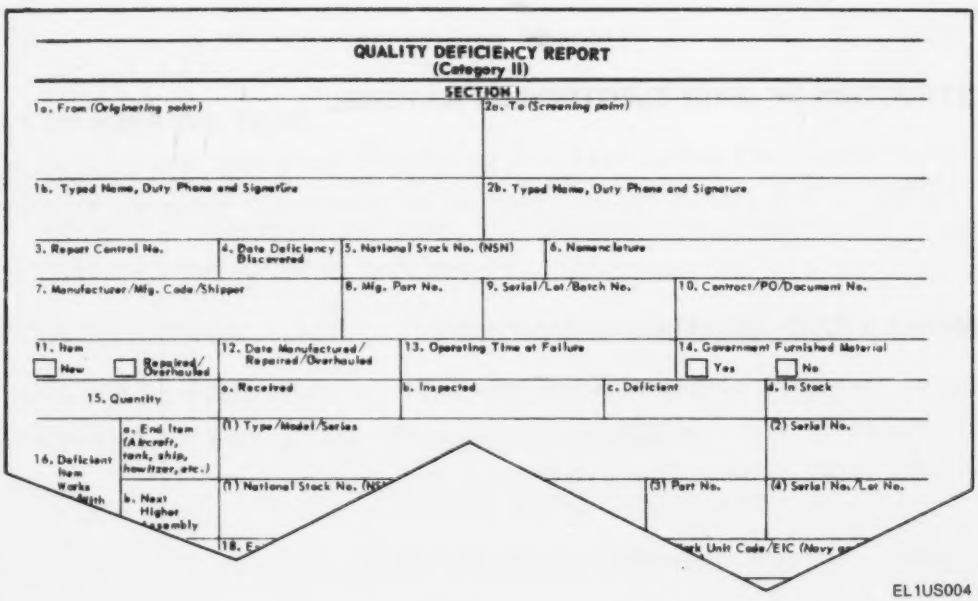
EL1US003

c. Discrepancy in Shipment Report (DISREP) (SF 361). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38/NAVSUPINST 4610.33C/AFR 75-18/MCO P4610.19D/DLAR 4500.15.

1-4. HAND RECEIPT (HR) MANUAL

There is no Hand Receipt Manual required for this equipment.

1-5. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)



QUALITY DEFICIENCY REPORT
(Category II)

SECTION I

1a. From (Originating point)

2a. To (Screening point)

1b. Typed Name, Duty Phone and Signature

2b. Typed Name, Duty Phone and Signature

3. Report Control No.

4. Date Deficiency Discovered

5. National Stock No. (NSN)

6. Nomenclature

7. Manufacturer/Mfg. Code/Shipper

8. Mfg. Part No.

9. Serial/Lot/Batch No.

10. Contract/PO/Document No.

11. Item ☐ New ☐ Repaired/Overhauled

12. Date Manufactured/Repaired/Overhauled

13. Operating Time at Failure

14. Government Furnished Material ☐ Yes ☐ No

15. Quantity

a. Received

b. Inspected

c. Deficient

d. In Stock

16. Deficient Item Works with

a. End Item (Aircraft, tank, ship, howitzer, etc.)

(1) Type/Model/Series

(2) Serial No.

b. Next Higher Assembly

(1) National Stock No. (NSN)

(3) Part No.

(4) Serial No./Lot No.

18. E...

...k Unit Code/EIC (Navy ...

EL1US004

a. Army. If your Multiplexer TD-1235(P)/TTC needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design. Put it on an SF 368 (Quality Deficiency Report). Mail it to Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: DRSEL-ME-MP, Fort Monmouth, New Jersey 07703-5007. We'll send you a reply.

b. Air Force. Air Force personnel are encouraged to submit EIRs in accordance with AFR 900-4.

c. Navy. Navy personnel are encouraged to submit EIRs through their local Beneficial Suggestion Program.

d. Marine Corps. Marine Corps Units shall submit NAVMC10772.

1-6. ADMINISTRATIVE STORAGE

Administrative storage of equipment issued to and used by Army activities will have preventive maintenance performed in accordance with the Preventive Maintenance Checks and Services (PMCS) charts before storing. When removing the equipment from administrative storage, the PMCS should be performed to assure operational readiness.

1-7. DESTRUCTION OF ARMY ELECTRONICS MATERIEL

Destruction of Army electronics materiel to prevent enemy use shall be in accordance with TM 750-244-2, Procedures for Destruction of Electronic Materiel to Prevent Enemy Use.

1-8. NOMENCLATURE CROSS-REFERENCE LIST

The following list will help you locate the official nomenclature of the major equipment associated with the LGM. Official nomenclature must be used when completing report forms or when using technical manuals.

Common Name	Official Nomenclature	Reference Designation
AAU	Analog Applique Circuit Card Assembly	A6-A13*
AC INPUT	Ac Input Circuit Card Assembly	A1
BITE 2	BITE 2 Circuit Card Assembly	A4
GP FRG	Group Framing Circuit Card Assembly	A15
INTFC	Interface Circuit Card Assembly	A16
LP MDM	Loop Modem Circuit Card Assembly	A6-A13*
MULTI VDC	Multi Vdc Circuit Card Assembly	A2

*The LGM can be configured with any combinations of AAU or LP MDM CCAs in slots A6 through A13.

1-8. NOMENCLATURE CROSS-REFERENCE LIST—Continued

Common Name	Official Nomenclature	Reference Designation
MUX/DEMUX	Multiplexer/Demultiplexer Circuit Card Assembly	A14
TMG GEN	Timing Generator Circuit Card Assembly	A5
52 VDC	+52 Vdc Circuit Card Assembly	A3

1-9. LIST OF ABBREVIATIONS

Abbreviations are spelled out the first time they appear in text. However, a complete list of all abbreviations used in this manual is given below as an additional aid to knowing their full meaning. Acronyms also are included.

Abbreviation/Acronym	Definition
BITE	Built-in Test Equipment
CCA	Circuit Card Assembly
DGM	Digital Group Multiplexing
DISREP	Discrepancy in Shipment Report
DNVT	Digital Nonsecure Voice Terminal
DSVT	Digital Secure Voice Terminal
EIR	Equipment Improvement Recommendation
GM	Group Modem (Modem, Digital Data MD-1026(P)/G)
GND	Ground
GP	Group
HR	Hand Receipt
kb/s	Thousand Bits per Second
LED	Light Emitting Diode

1-9. LIST OF ABBREVIATIONS—Continued

Abbreviation/Acronym	Definition
LGM	Loop Group Multiplexer (Multiplexer TD-1235(P)/TTC)
LOI	Loss of Input
LSCDM	Low Speed Cable Driver Modem, (Modem, Cable Driver MD-1023(P)/G)
MAC	Maintenance Organization Chart
MDCS	Maintenance Data Collection Subsystem
MGM	Master Group Multiplexer (Multiplexer TD-1237(P)/G)
MTOE	Modified Table of Organization and Equipment
MUX/DEMUX	Multiplexer/Demultiplexer
MWO	Modification Work Orders
NRZ	Nonreturn to Zero
PMCS	Preventive Maintenance Checks and Services
RM	Radar Modem (Modem, Digital Data MD-1065/G)
ROD	Report of Discrepancy
TED	Trunk Encryption Device
TGM	Trunk Group Multiplexer (Multiplexer TD-1236/G)
TM	Technical Manual
TMDE	Test, Measurement, and Diagnostic Equipment
TO	Technical Order
TRF	Traffic

Section II. EQUIPMENT DESCRIPTION

1-10. PURPOSE

The LGM is a digital channel multiplexer (DGM) device used in multichannel communication systems. Its primary function is the time division multiplexing of a maximum of 16 digital traffic channel into a single digital group and the demultiplexing of a group into 16 channels. An additional 32 kb/s overhead channel is allocated for telemetry and the framing pattern. The channels can be analog or digital.

1-11. EQUIPMENT CHARACTERISTICS, CAPABILITIES, FEATURES, AND USES

a. Characteristics.

- Shelter and rack mounted
- Powered from standard 115-Vac line
- Interfaces with many different DGM equipments

b. Capabilities.

- Synchronous multiplexing
- Synchronous demultiplexing
- Operates from looped back or external clock
- Variable configuration

c. Features.

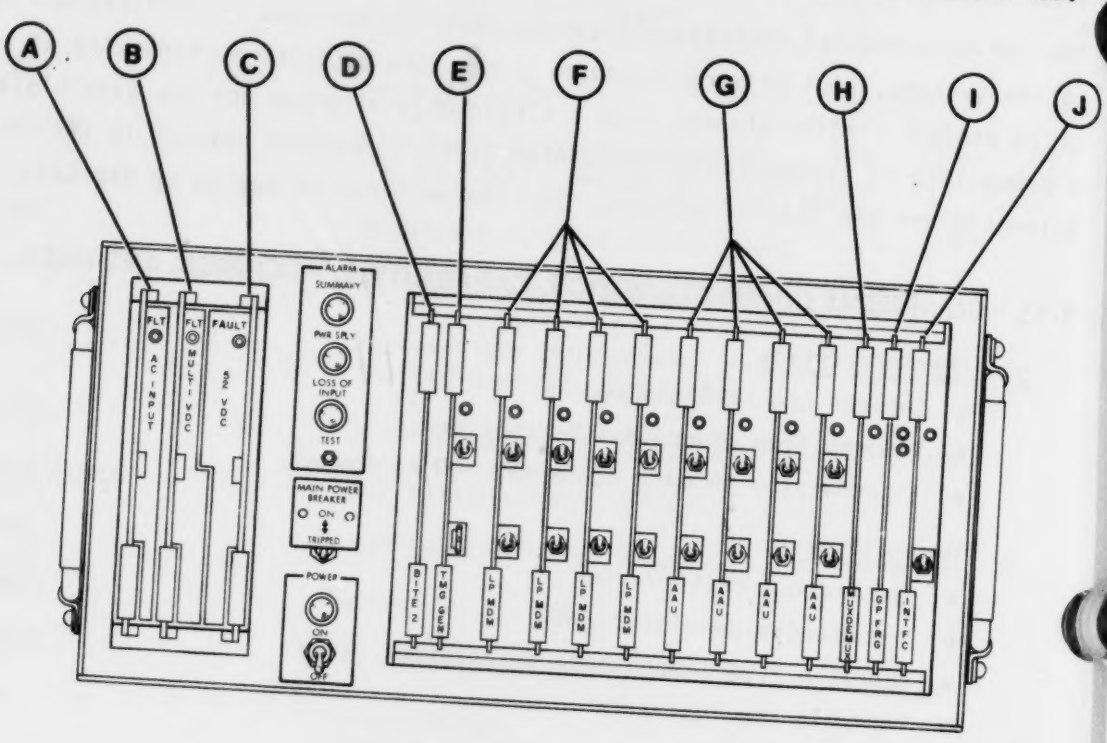
- Simple operation
- Built-in test equipment
- Rapid access to assemblies for ease of repair

d. Used With.

- AN/TRC-170(V)1
- AN/TRC-170(V)2
- AN/TRC-170(V)3

1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

All major components of the LGM are in a metal case which may be rack mounted.



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NOTE

Reference designators are shown on LGM cover.

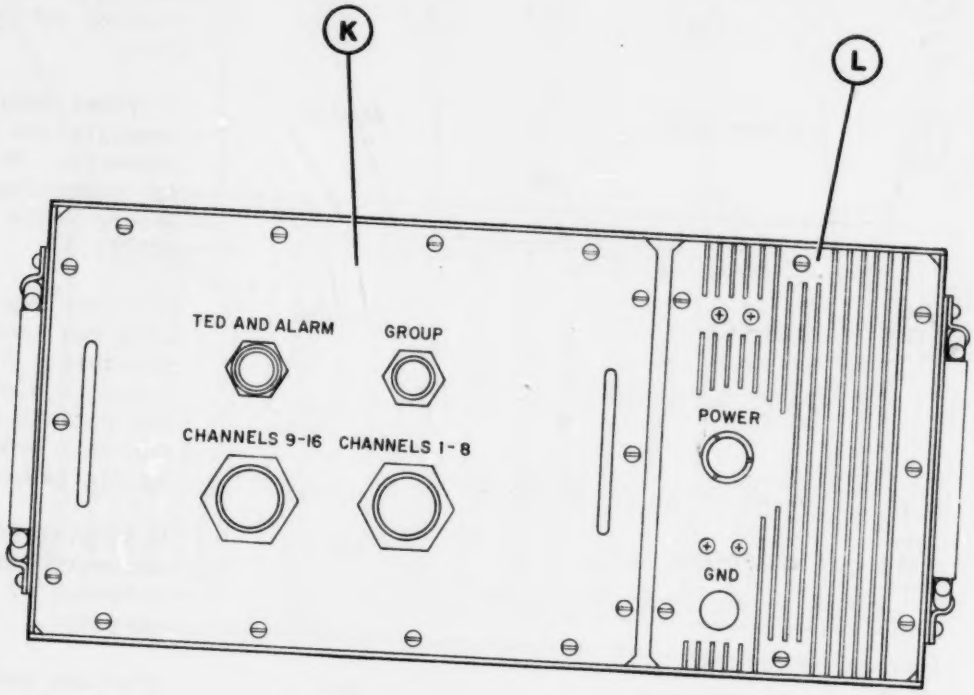
Key	Name	Reference Designation	Function
(A)	AC INPUT CCA	A1	Provides rectified ac, sums system faults, drives indicator lamps, and initiates nuclear shutdown.
(B)	MULTI VDC CCA	A2	Provides ±5 and ±10 Vdc.
(C)	52 VDC CCA	A3	Provides +52 Vdc.
(D)	BITE 2 CCA	A4	Monitors status of key signals on each CCA.

1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS—Continued

Key	Name	Reference Designation	Function
(E)	TMG GEN CCA	A5	Provides timing signals necessary to control framing and synchronization.
(F)	LP MDM CCA*	A6-A13	Provides modulation and demodulation of the digital channels. Provides power for subscriber Digital Secure Voice Terminal (DSVT).
(G)	AAU CCA*	A6-A13	Provides duplex processing with two independent analog channels. Simultaneously converts digital baseband NRZ data to analog voice. Converts analog voice and to digital baseband NRZ.
(H)	MUX DEMUX CCA	A14	Multiplexes/demultiplexes channels and subchannels into/out of group data stream.
(I)	GRP FRG CCA	A15	Provides generation of outgoing group frame patterns. Detects incoming group frame patterns required to maintain duplex link synchronization.
(J)	INTFC CCA	A16	Provides group interface of data and timing signals.

*The LGM can be configured with any combination of loop modem or analog applique CCAs in slots A6 through A13.

1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS—Continued



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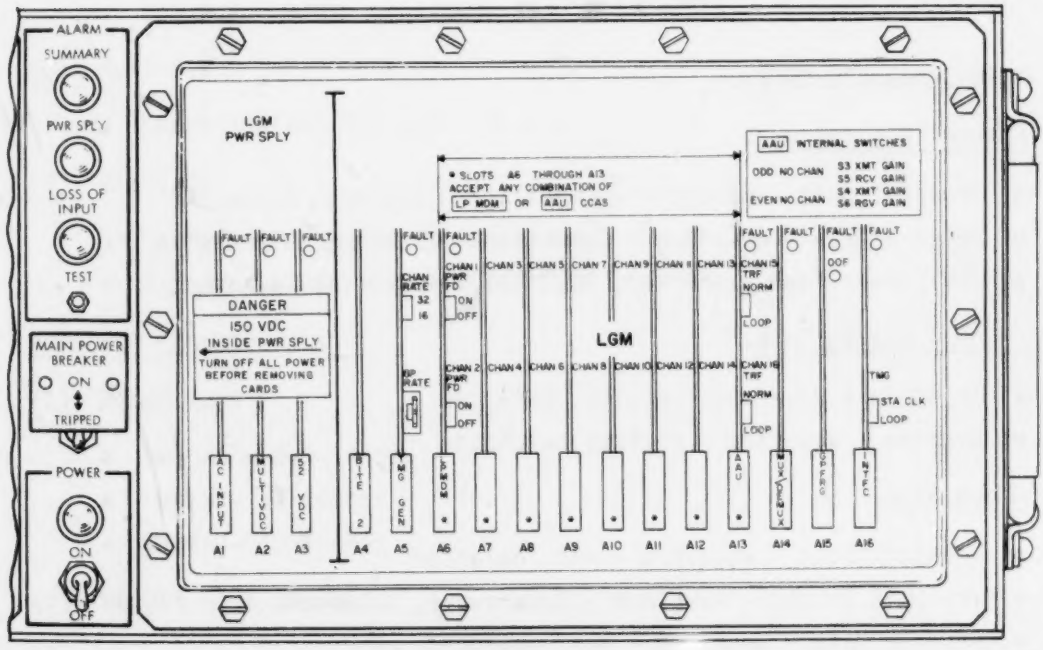
1-12. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS—Continued

Key	Name	Function
(K)	Connector Assembly, Rear	Interfaces LGM with other equipment.
(L)	Connector Assembly	Connects LGM to 115 Vac.

1-13. EQUIPMENT CONFIGURATIONS

The LGM can provide either loop modem or analog applique functions. It contains 16 channels on eight CCAs. The LGM can be configured with any combination of loop modem or analog applique CCAs in slots A6 through A13. The remainder of the CCAs must be in their allocated slots.



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1-14. APPLICATIONS

The LGM is installed in shelters or vans. It interfaces with other DGM and non-DGM units in a number of interconnection arrangements. These arrangements are those required by the communications system in which it operates. The LGM may interface with one or more of the following:

a. Digital Secure Voice Terminal KY-68/TSEC (DSVT)
b. Digital Nonsecure Voice Terminal TA-954/TT (DNVT)
c. Multiplexer TD-1236/G (TGM)
d. Multiplexer TD-1237(P)/G (MGM)
e. Modem, Cable Driver MD-1023(P)/G (LSCDM)
f. Modem, Digital Data MD-1026(P)/G (GM)
g. Trunk Encryption Device KG-81 (TED)
h. Station Clock Generating Unit
i. Digital Data Modem MD-1065/G (RM)
j. System Status/Display Equipment

1-15. PERFORMANCE DATA

a. Channel Digital Data.

- Transmit Data - Waveform - Conditioned diphase, balanced
- Receive Data - Waveform - Conditioned diphase, balanced
- DSVT Power Feed - +52 Vdc, 83.3 milliampere (mA) maximum

b. Channel Analog Data.

- Transmit - Waveform - Analog, balanced
- Receive - Waveform - Analog, balanced

c. Group Side.

- Transmit Data - Waveform - NRZ, balanced
- Transmit Timing - Waveform - Squarewave, balanced
- Receive Data - Waveform - NRZ, balanced
- Receive Timing - Waveform - Squarewave, balanced

d. Station Clock Input.

- Waveform - Squarewave, balanced

1-15. PERFORMANCE DATA—Continued

e. Interface Signals.

- Resync Command - Waveform - Pulse, balanced
- Frame Squelch - Waveform - Dc level, unbalanced

f. Alarms.

- S - Summary fault
- SA - Summary fault except for loss of sync

g. Prime Power.

- Ac Input - 104 to 126 volts (ac), 47 Hz to 420 Hz, 67 watts nominal

h. Environmental Characteristics.

(1) Temperature

- Operating - -25°F to +145°F (-32°C to +63°C)
- Storage - -70°F to +160°F (-57°C to +71°C)

(2) Humidity

- Operating and Storage - Tropical levels

(3) Altitude

- Operating - 10,000 feet maximum
- Air Transportation - 40,000 feet maximum

i. Physical Characteristics.

(1) Dimensions

- Height - 8.5 inches
- Depth - 12 inches
- Width - 19 inches

(2) Weight - 35 pounds

(3) Type of Mounting - 19-inch rack

1-15. PERFORMANCE DATA—Continued

j. LGM Interconnection Data Table.

Channel Rate Selection	Group Rate Selection		Number of Usable Channels	Format (Pattern)
	Position	Kbs		
16	2	128	7	A
16	3	144	8	B
16	4	256	15	C
16	5	288	16	D
32	4	256	7	A
32	5	288	8	B
32	6	512	15	C
32	7	576	16	D

FORMAT PATTERN

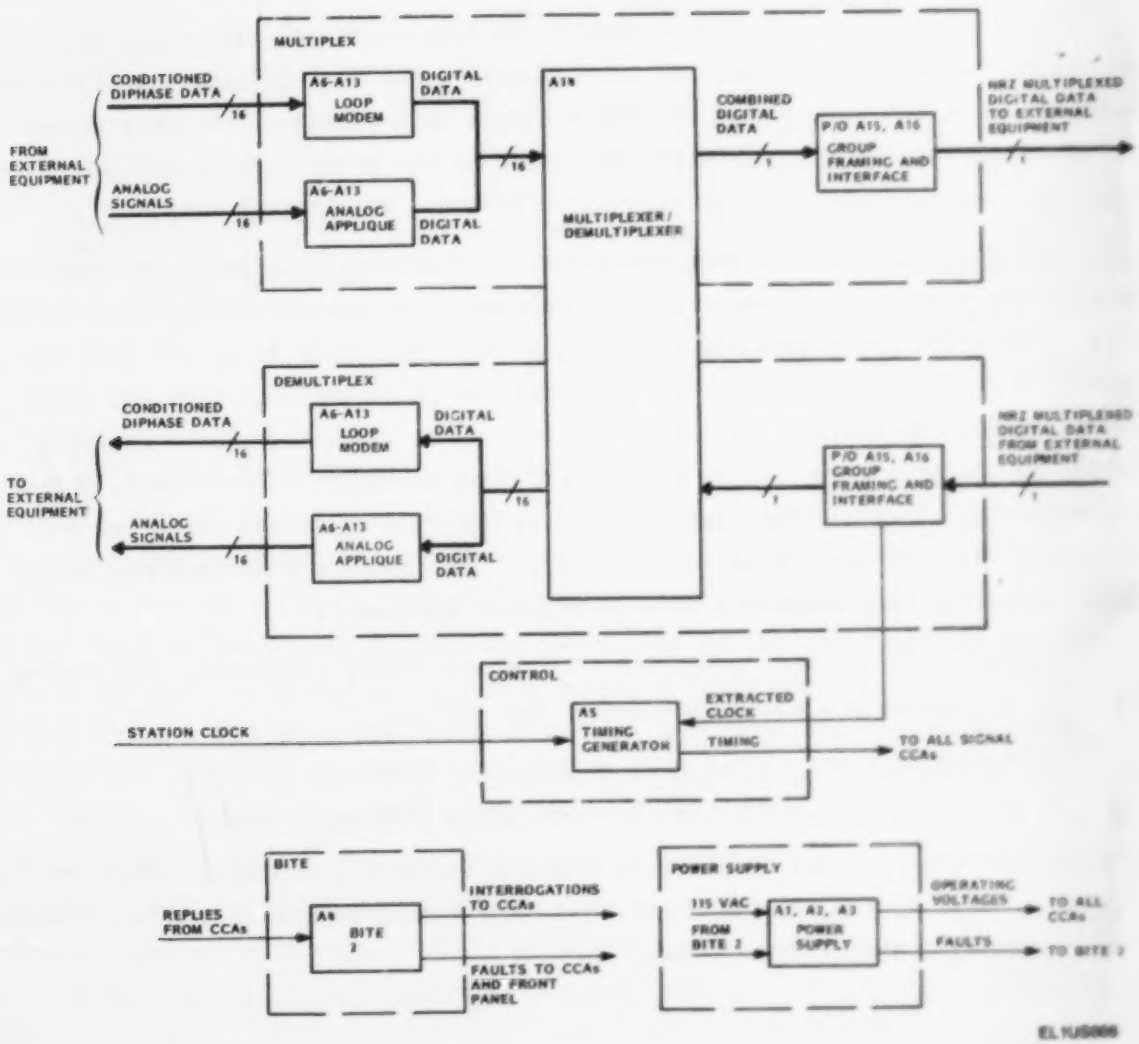
Format	O = Overhead Channel C = Usable Channel S = Spare (digital)
A	O C_1 C_2 C_3 C_4 C_5 C_6 C_7 O C_1 C_2 C_3
B	O C_1 C_2 C_3 C_4 C_5 C_6 C_7 C_8 O C_1 C_2 C_3
C	O C_1 C_2 C_3 C_4 C_5 C_6 C_7 C_8 C_9 C_{10} C_{11} C_{12} C_{13} C_{14} C_{15} O C_1 C_2 C_3
D	O SP C_1 C_2 C_3 C_4 C_5 C_6 C_7 C_8 C_9 C_{10} C_{11} C_{12} C_{13} C_{14} C_{15} C_{16} O SP C_1 C_2 C_3

Section III. PRINCIPLES OF OPERATION

1-16. LGM FUNCTIONAL DESCRIPTION

The LGM has five functional groups:

- Multiplex
- Demultiplex
- Control
- BITE
- Power Supply



1-16. LGM FUNCTIONAL DESCRIPTION—Continued

a. Multiplex. The LGM receives up to 16 traffic channels and multiplexes them to form a single data stream. This data is sent to other equipment. The 16 traffic channels from external equipment can be:

- 16 analog channels
- 16 digital channels
- Combinations, two channels at a time

Conditioned diphase digital data is fed to the loop modem and the analog channels are fed to the analog applique. After modulation, the digital data and digitized analog channels are multiplexed to form a single data stream. This data stream is framed and interfaced to external equipment by the group framing and interface function. The multiplexed group channel is balanced NRZ digital data.

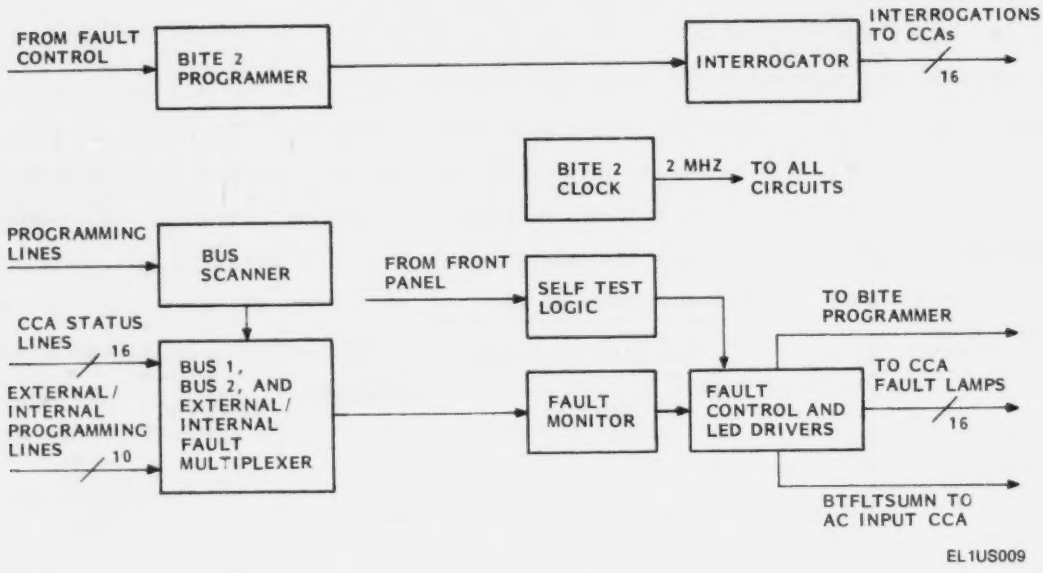
b. Demultiplex. The LGM gets group data from external equipment and demultiplexes it to form up to 16 separate data streams. The group framing and interface function receives group data and reframes, alines, and sends it to the demultiplexer. The demultiplexer function separates the 16 channels of data and sends them to either the analog applique or the loop modem circuits. Those channels applied to the analog applique are converted from nonreturn to zero (NRZ) digital data to analog signals. The channels sent to the loop modem are converted from NRZ digital data to conditioned diphase data. The channels from both the analog applique and the loop modem are sent to external equipment.

c. Control. The control group consists of the timing generator. The timing generator is slaved to a clock from one of two sources:

- A station clock signal from external equipment
- An extracted clock signal from the group framing circuits

The extracted clock signal is obtained from the incoming group data by framing circuits. After slaving to the clock signal the timing generator develops timing signals used by all the signal CCAs.

1-16. LGM FUNCTIONAL DESCRIPTION—Continued

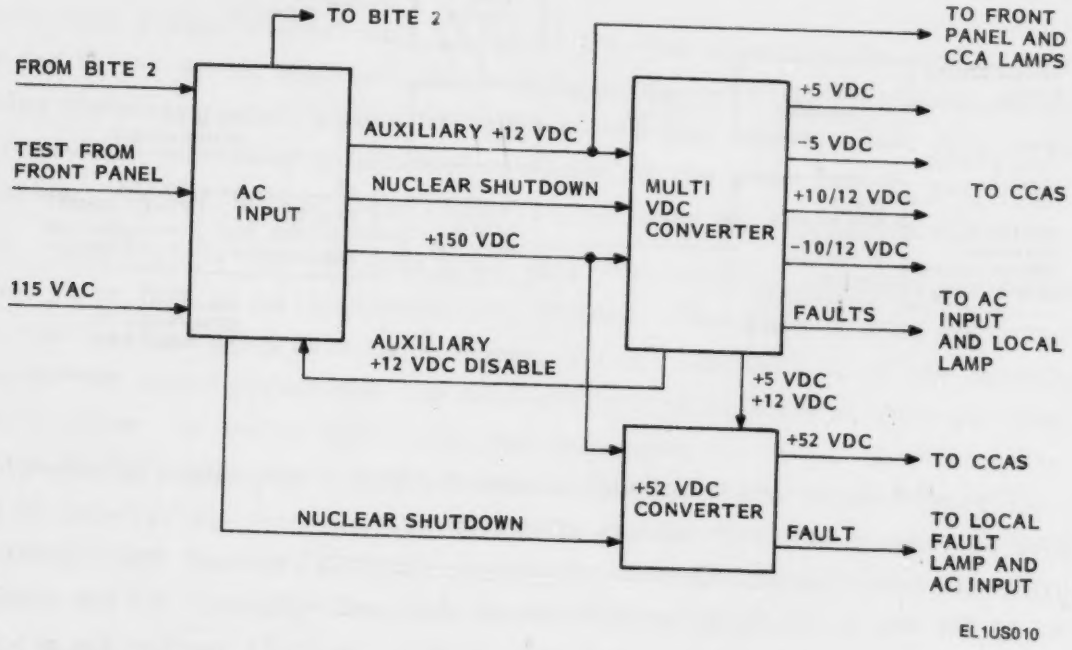


d. BITE. The fault control circuits cause the BITE 2 programmer to decode CCA addresses for use by the interrogator. Each LGM BITE-sensored CCA is interrogated in turn by the interrogator. When interrogated, each CCA replies. The replies are applied to the bus 1, bus 2, external/internal fault multiplexer. The bus scanner selects each of the inputs in turn and sends them to the fault monitor for processing. If a fault is sensed for repeated scans, a fault signal is sent to the fault control and LED drivers. The fault condition is decoded and the driver lights the correct LED. Both the CCA fault light and a summary fault light on the front panel are lighted. Control signals are also sent to the BITE 2 programmer. BITE 2 generates its own clock (2 MHz) that feeds all BITE circuits. Use of the LGM timing generator clock would not allow BITE to detect a timing generator failure. The external/internal multiplexer inputs provide data on whether the fault is external or internal. A front panel switch allows the self test of BITE by lighting fault LEDs in sequence.

1-16. LGM FUNCTIONAL DESCRIPTION—Continued

e. Power Supply. The LGM power supply consists of:

- Ac input function
- Multi Vdc converter
- +52 Vdc converter



The ac input function has four inputs:

- 115 Vac
- Test from front panel
- Interrogation from BITE 2
- Auxiliary +12 Vdc disable

The ac input function has five outputs:

- +150 Vdc
- Auxiliary +12 Vdc

1-16. LGM FUNCTIONAL DESCRIPTION—Continued

- Nuclear shutdown to multi Vdc converter
- Nuclear shutdown to +52 Vdc converter
- Replies to BITE 2

The ac input function converts 115 Vac to +150 Vdc. It also produces an auxiliary 12 Vdc output. This +12 Vdc goes to the multi Vdc converter, the CCA fault lamps, and the front panel lights. After the +12 Vdc is obtained from the multi Vdc converter, the auxiliary +12 Vdc disable command shuts down the auxiliary +12 Vdc supply. When the ac input function detects nuclear radiation, shutdown commands are sent to the multi Vdc converter and the +52 Vdc converter. When the front panel test switch is pressed, the test input causes the ac input function to light logic CCA fault LEDs and front panel lights. BITE 2 interrogates the ac input function and it replies with the power supply status.

The multi Vdc converter converts +150 Vdc to:

- +5 Vdc
- -5 Vdc
- +10/12 Vdc
- -10/12 Vdc

These voltages are sent to all LGM CCAs requiring them. Faults within the CCA are reported to the ac input function and light the card LED. Reference voltages of +12 and +5 Vdc are sent to the +52 Vdc converter.

The +52 Vdc converter converts +150 Vdc to +52 Vdc. Using reference voltages from the multi Vdc converter the +52 Vdc is regulated. This regulated +52 Vdc is sent to all CCAs that require it. Faults within the CCA are reported to the ac input CCA and light the CCA LED.

CHAPTER 2
OPERATING INSTRUCTIONS

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Section I	Description and Use of Operators Controls and Indicators	2-2
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2-2	Rear Panel Connectors	2-4
2-3	Circuit Card Assembly Controls and Indicators	2-6
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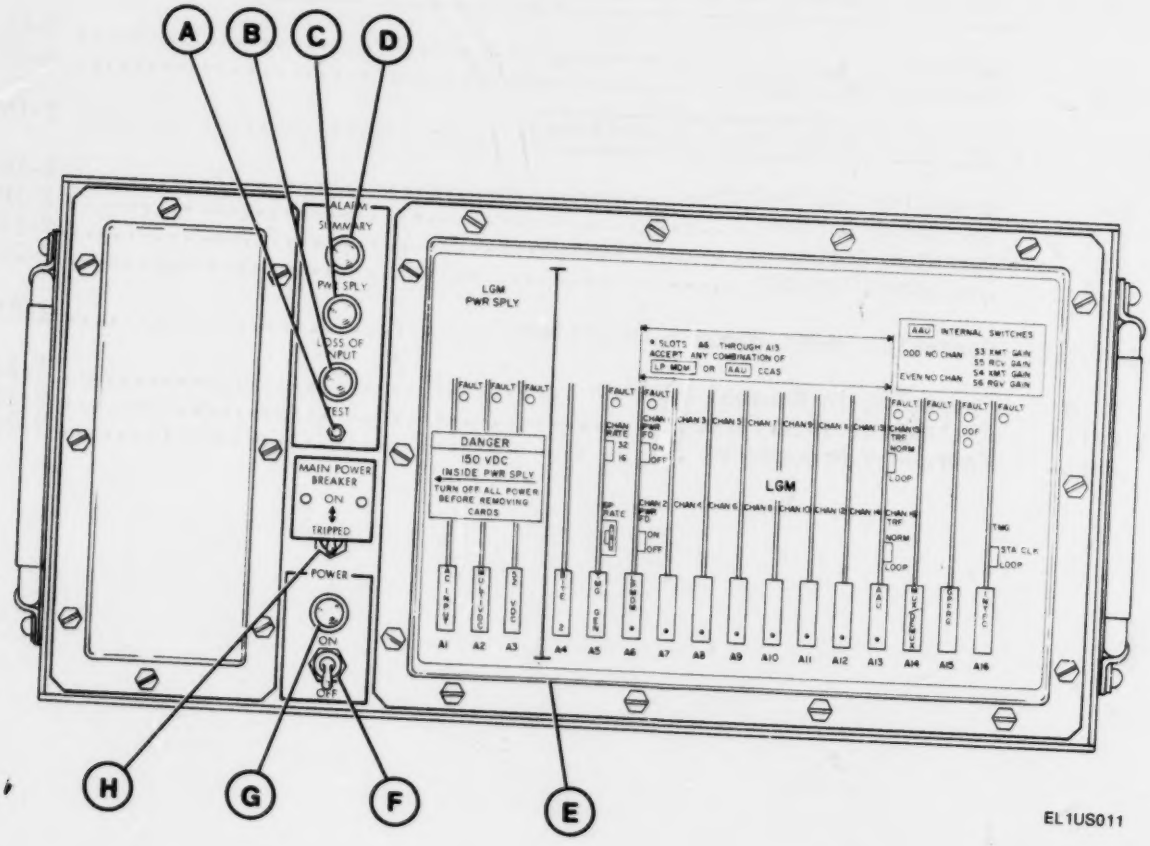
Section I. DESCRIPTION AND USE OF OPERATORS CONTROLS AND INDICATORS

2-1. FRONT PANEL CONTROLS AND INDICATORS

All LGM operator controls and indicators are located on the front panel. All other controls and indicators are located on the CCAs and are for maintenance and system setup.



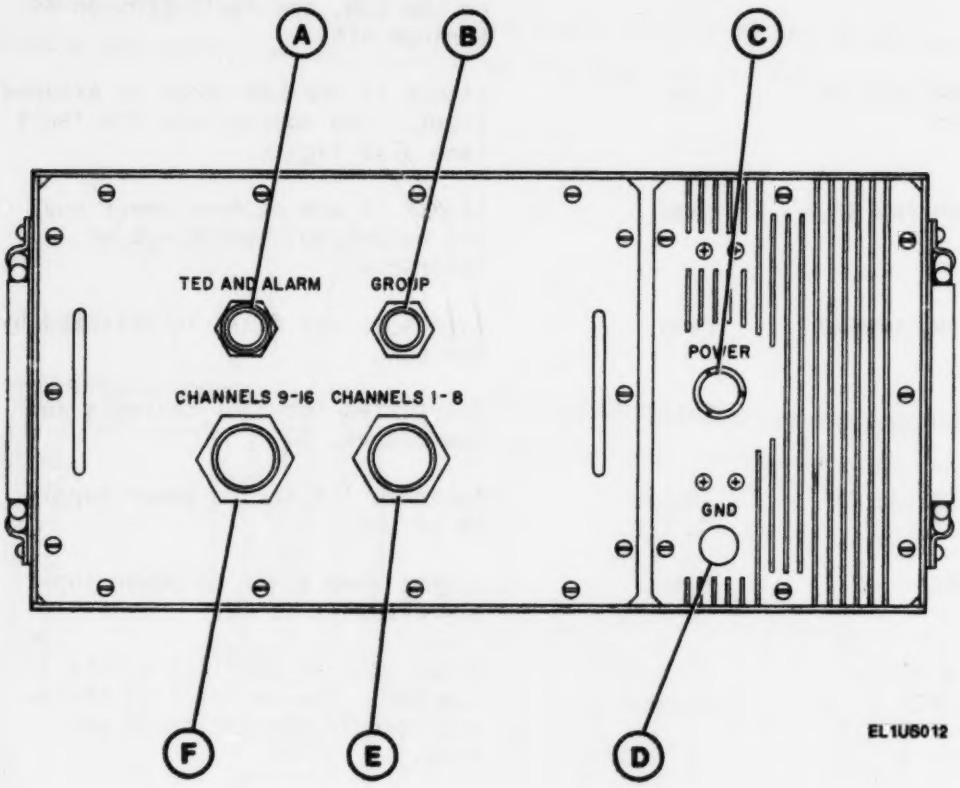
EL1US011

The label on the front panel shows the locations of all CCAs and CCA mounted controls and indicators. The label is a handy reference for use during maintenance and system setup. Switch settings may be marked on the label with a grease pencil.

2-1. FRONT PANEL CONTROLS AND INDICATORS—Continued

Key	Name	Type	Function
(A)	ALARM TEST	Pushbutton	Energizes the BITE circuits in a test mode to light all fault lamps on the LGM, and fault LEDs on A4 through A16.
(B)	ALARM LOSS OF INPUT	Lamp	Lights if the LGM loses an external input. The appropriate CCA fault lamp also lights.
(C)	ALARM PWR SPLY	Lamp	Lights if one or more power supply output voltage is out of tolerance.
(D)	ALARM SUMMARY	Lamp	Lights if any fault is detected by the LGM.
(E)	LABEL	Label	Identifies internal controls and indicators.
(F)	POWER ON/OFF	Toggle Switch	Switches 115 Vac to power supply ON or OFF.
(G)	POWER	Lamp	Lights when power to power supply circuits is ON.
(H)	MAIN POWER BREAKER	Circuit Breaker	Trips when an overload exists in the LGM. Can be reset by throwing circuit breaker to ON position.

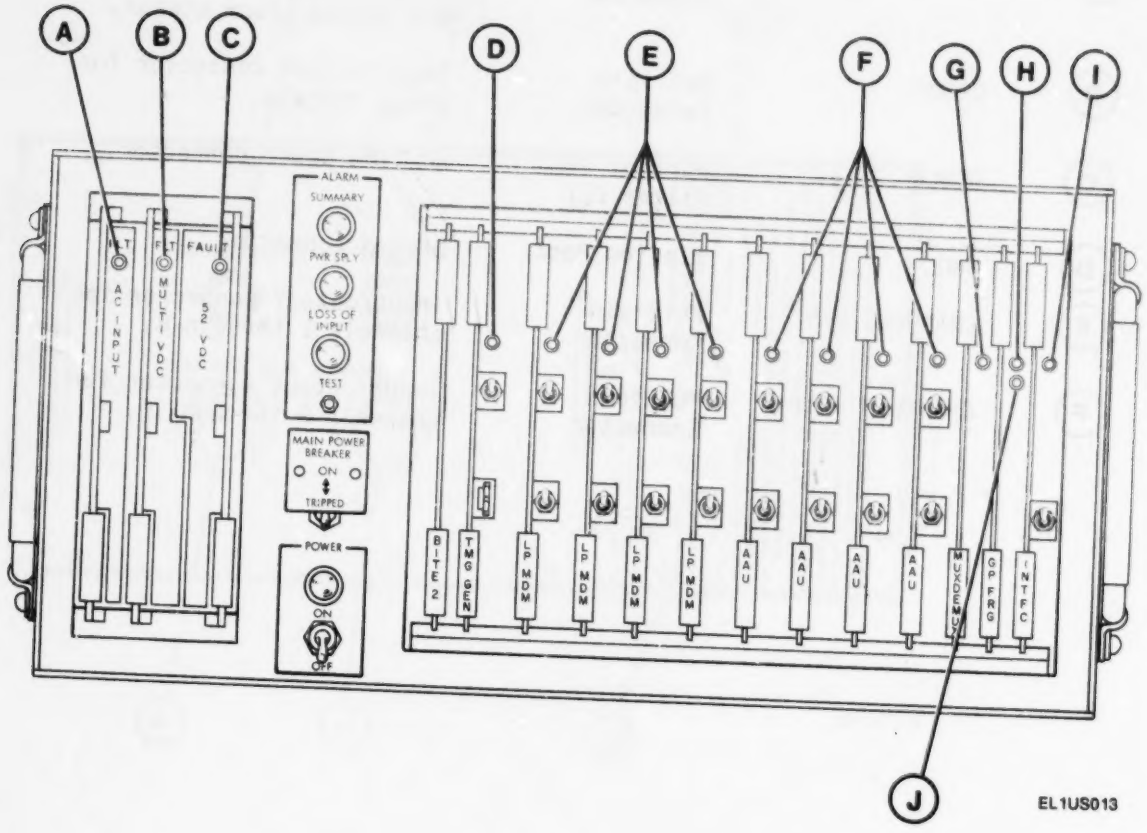
2-2. REAR PANEL CONNECTORS



2-2. REAR PANEL CONNECTORS—Continued

Key	Name	Type	Function
(A)	TED AND ALARM	Multipin Connector	Input/output connector for trunk encryption device signals and remote alarm status.
(B)	GROUP	Multipin Connector	Input/output connector for group signals.
(C)	POWER	Part of RF Filter FL1	Ac line power connector.
(D)	GND	Binding Post	Ground connector.
(E)	CHANNELS 1-8	Multipin Connector	Input/output connector for channels 1 through 8.
(F)	CHANNELS 9-16	Multipin Connector	Input/output connector for channels 9 through 16.

2-3. CIRCUIT CARD ASSEMBLY CONTROLS AND INDICATORS

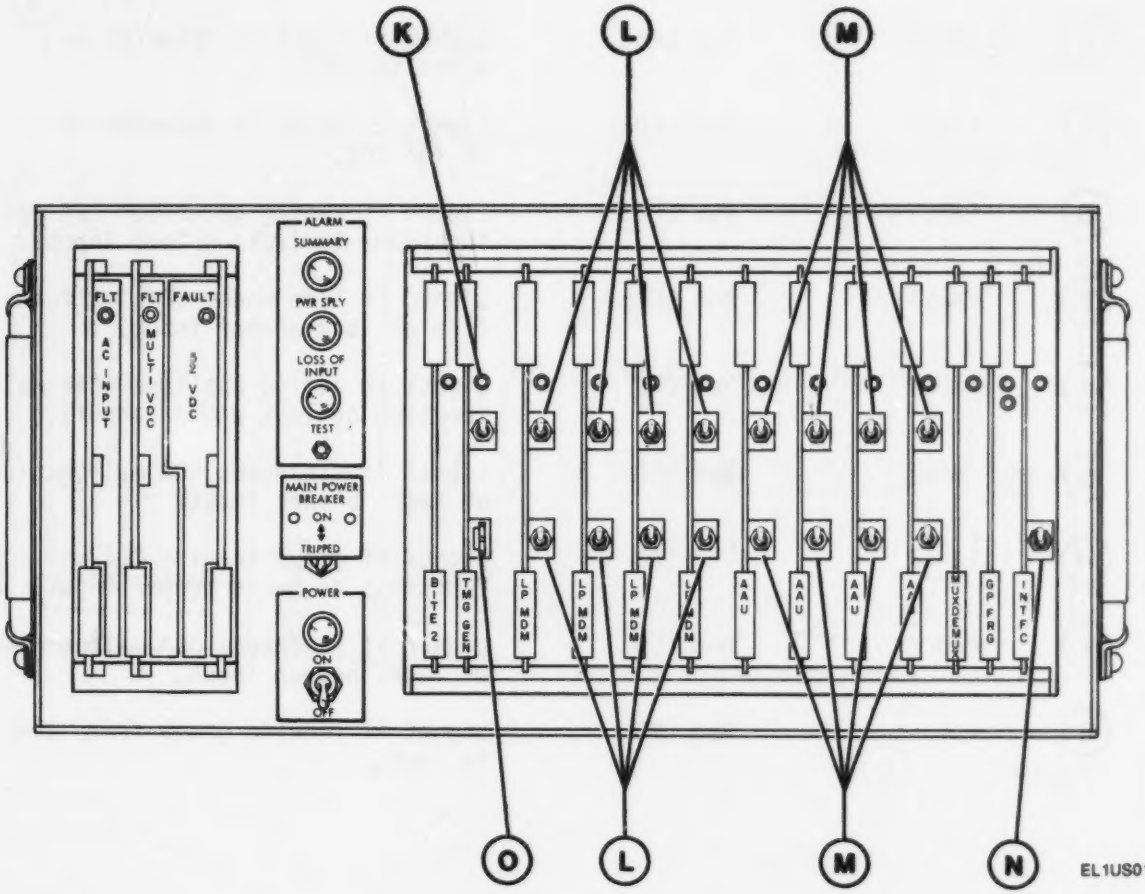


EL1US013

2-3. CIRCUIT CARD ASSEMBLY CONTROLS AND INDICATORS—Continued

Key	Name	Type	Function
(A)	FAULT	Red LED	Lights if fault is detected on ac input CCA.
(B)	FAULT	Red LED	Lights if fault is detected on multi Vdc CCA.
(C)	FAULT	Red LED	Lights if fault is detected on 52 Vdc CCA.
(D)	FAULT	Red LED	Lights if timing generator CCA malfunctions or lacks proper input.
(E)	FAULT	Red LED	Lights if loop modem CCAs malfunction or lack proper input.
(F)	FAULT	Red LED	Lights if analog applique CCAs malfunction or lack proper input.
(G)	FAULT	Red LED	Lights if mux/demux CCA malfunctions or lacks proper input.
(H)	FAULT	Red LED	Lights if group framing CCA malfunctions or lacks proper input.
(I)	FAULT	Red LED	Lights if interface CCA malfunctions or lacks proper input.
(J)	OOF	Red LED	Lights if receive group frame sync is lost.

2-3. CIRCUIT CARD ASSEMBLY CONTROLS AND INDICATORS—Continued

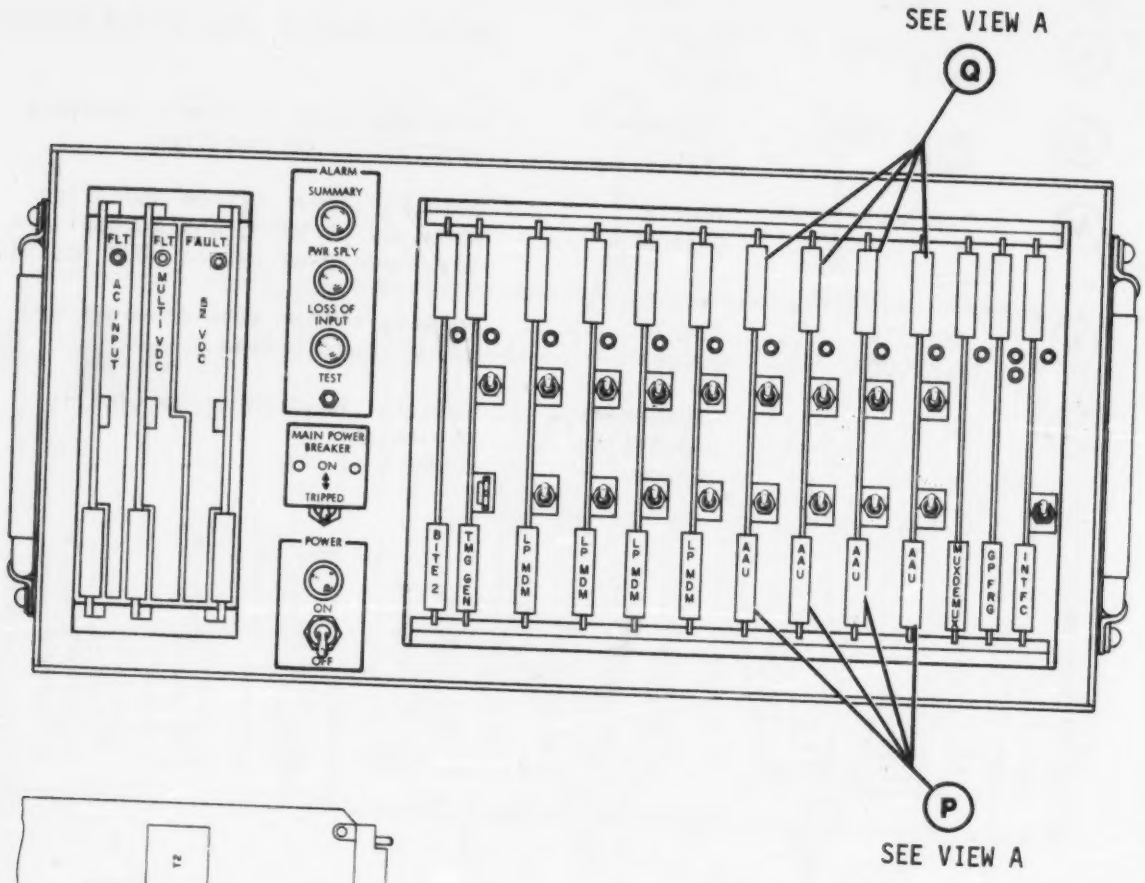


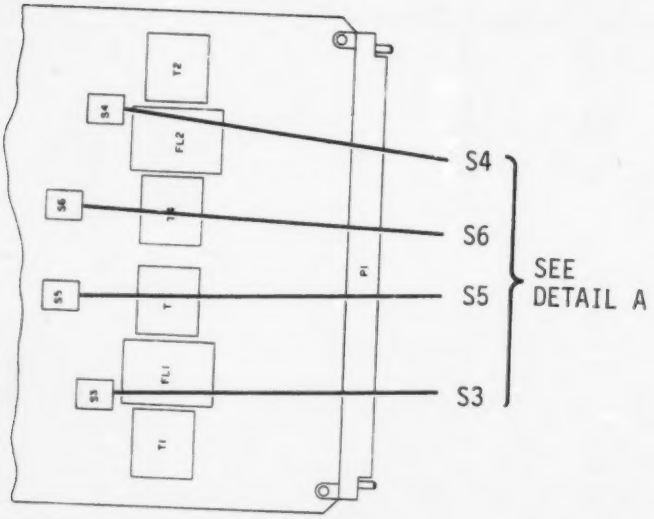
2-3. CIRCUIT CARD ASSEMBLY CONTROLS AND INDICATORS—Continued

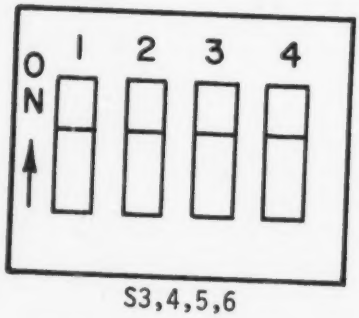
Key	Name	Type	Function
(K)	CHAN RATE 32/16	Toggle Switch	Selects desired channel bit rate.
(L)	POWER FEED* ON/OFF	Toggle Switch	Provides power to field handsets when set to ON position.
(M)	TRF NORM/LOOP*	Toggle Switch	Selects normal system operation when set to NORM, analog applique test mode when set to LOOP position.
(N)	TMG STA CLK/LOOP	Toggle Switch	Selects either station clock or group input timing.
(O)	GP RATE	Thumbwheel, 8-position switch	Selects required group traffic bit rate.

*POWER FEED ON/OFF toggle switch is part of loop modem CCA. TRF NORM/LOOP toggle switch is part of analog applique CCA. The LGM can be configured with any combination of loop modem or analog applique CCAs.

2-3. CIRCUIT CARD ASSEMBLY CONTROLS AND INDICATORS—Continued







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2-3. CIRCUIT CARD ASSEMBLY CONTROLS AND INDICATORS—Continued

Key	Name	Type	Function
(P)	CHANNEL TRANSMIT GAIN	Four pole, slide actuator dip switch-SPST	Selects required channel TRANSMITTER gain for cable attenuation.
(Q)	CHANNEL RECEIVER GAIN	Four pole, slide actuator dip switch-SPST	Selects required channel RECEIVER gain for cable attenuation.

Section II. OPERATOR PREVENTIVE MAINTENANCE CHECKS AND SERVICES

2-4. GENERAL

To be sure that your equipment is always ready for your mission, you must do scheduled preventive maintenance checks and services (PMCS). The scheduled inspections allow defects to be discovered and corrected before they result in serious damage or failure.

2-5. OPERATOR PMCS TABLE

A PMCS table for the TGM is provided below. There is one catagory of PMCS: W. It heads the Interval column of the PMCS table. A dot in the Interval column indicates the check and/or service that you should perform at a particular time.

a. W stands for weekly. W - PMCS are important preventive maintenance checks and services you make at weekly intervals to keep serious problems from suddenly happening. You should perform W - PMCS if:

- You are the assigned operator and have not operated the item since the last W - PMCS.
- You are operating the item for the first time.

2-5. OPERATOR PMCS TABLE—Continued

b. If your equipment fails to operate. Troubleshoot with proper equipment. Report any deficiencies using the proper forms (see DA PAM 738-750).

NOTE

Use your PMCS table Item no. column to get the number for the TM ITEM NO. column of DA Form 2404 (Equipment Inspection and Maintenance Worksheet) when recording results of PMCS.

NOTE

If your equipment must be in operation all the time, check and service those items that can be checked and serviced without disturbing operation. Make the complete checks and services when the equipment can be shut down or when orderwire channels are available.

c. Routine checks are not listed as PMCS checks. The following are some of the routine checks:

- Checking for frayed cables
- Storing items not in use
- Covering unused receptacles
- Checking for loose nuts, bolts, and screws
- Cleaning
- Washing
- Dusting

d. You should perform routine checks as the need comes up.

2-5. OPERATOR PMCS TABLE—Continued

DA FORM 2404, EQUIPMENT INSPECTION AND MAINTENANCE WORKSHEET.

EQUIPMENT INSPECTION AND MAINTENANCE WORKSHEET

For use of this form, see TM 38-750; the proponent agency is the Office of the Deputy Chief of Staff for Logistics.

1. ORGANIZATION	2. NOMENCLATURE AND MODEL
126 Signal Company, Fort Myer, VA	

3. REGISTRATION/SERIAL/FSN	4a. MILES	b. HOURS	c. ROUNDS FIRED	d. HOT STARTS	5. DATE	6. TYPE INSPECTION
					13 Jun	PMCS

7. APPLICABLE REFERENCE

TM NUMBER	TM DATE	TM NUMBER	TM DATE

INSTRUCTIONS - Perform each check listed in the TM applicable to the inspection performed. Following the sequence listed in pertinent TM, complete form as follows:

COLUMN a - Enter TM item number.

COLUMN b - Enter the applicable condition status symbol.

COLUMN c - Enter deficiencies and shortcomings.

COLUMN d - Show corrective action for deficiency or shortcoming listed in Column c.

COLUMN e - Individual ascertaining completed corrective action initial in this column.

ALL INSPECTIONS AND EQUIPMENT CONDITIONS RECORDED ON THIS FORM HAVE BEEN DETERMINED IN ACCORDANCE WITH DIAGNOSTIC PROCEDURES AND STANDARDS IN THE TM CITED HEREON.

8a. SIGNATURE (Person(s) performing inspection)	8b. TIME	9a. SIGNATURE (Maintenance Supervisor)	9b. TIME	10. MANHOURS REQUIRED
Joseph D. Soldier	0920 hours			

TM ITEM NO. a	STATUS b	DEFICIENCIES AND SHORTCOMINGS c	CORRECTIVE ACTION d	INITIAL WHEN CORRECTED e
11		Power indicator lamp failed to light.	Replaced bulb.	J.D.L

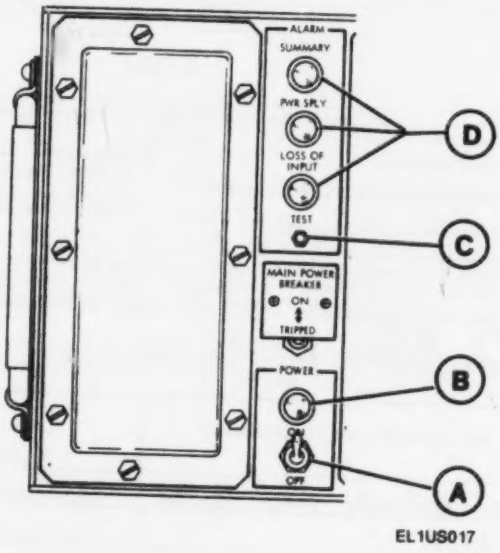
USE PMCS ITEM NO.

DA FORM 1 JAN 64 2404

EL1US016

2-5. OPERATOR PMCS TABLE—Continued

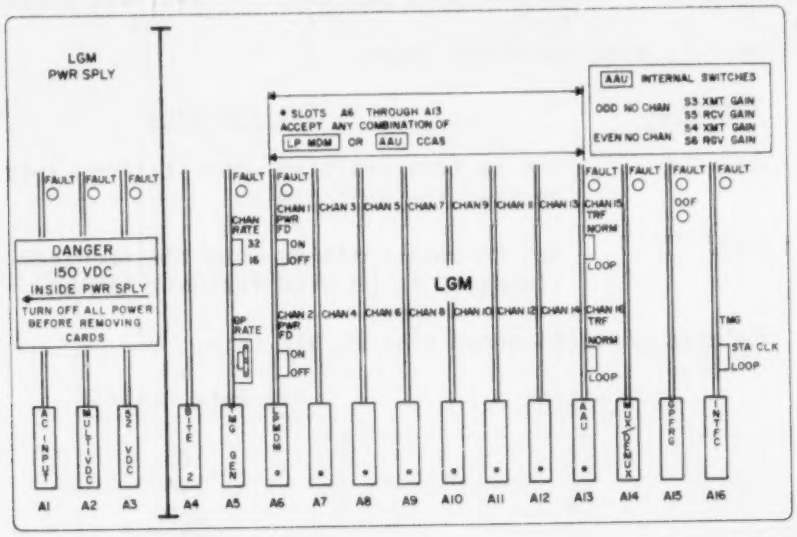
PMCS TABLE

ITEM NO.	INTERVAL W	ITEM TO BE INSPECTED	PROCEDURES CHECK AND HAVE REPAIRED OR ADJUSTED AS NECESSARY.	FOR READINESS REPORTING EQUIPMENT IS NOT READY/ AVAILABLE IF:
1	•	LGM BITE Test	 EL1US017 (A) Set POWER ON/OFF switch to ON. (B) POWER lamp lights. (C) Press ALARM TEST switch. (D) ALARM SUMMARY, PWR SPLY, and LOSS OF INPUT lamps light.	POWER lamp does not light. ALARM SUMMARY, PWR SPLY, and LOSS OF INPUT lamps do not light, or if lamp stays on after switch is released.

Section III. OPERATION UNDER USUAL CONDITIONS

2-6. RESETTING CCA SWITCHES

After initial installation and operation of the LGM, changes in system use may require resetting switches on the LGM. If CCA switches must be reset, refer to the following table for switch setting data. Changes of system parameters will be directed by personnel at the system control point. Refer to label map on front cover. See paragraph 4-14 for cover removal.



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Switch Name	Function
CHAN RATE	Selects required channel bit rate.

Position	Setting Data
32	Set to this position when 32 kbs is required.
16	Set to this position when 16 kbs is required.

POWER FEED — Selects channel power feed.

Position	Setting Data
ON	Provides power to field handsets.
OFF	Turns off power to field handsets.

2-6. RESETTING CCA SWITCHES—Continued

Switch Name	Function
TRF	Selects AAU mode function.

Position	Setting Data
NORM	Set to this position for normal system operation.
LOOP	Set to this position for AAU test purposes.

TMG — Selects required clock source.

Position	Setting Data
STA CLK	Set to this position when station clock is to be used for unit timing.
LOOP	Set to this position when the received group timing is to be used for unit timing.

GP RATE — Selects required group traffic bit rate.

Position	Bit Rate (kb/s)
2	128
3	144
4	256
5	288
6	512
7	576

NOTE

Positions 0 and 1 cannot be selected

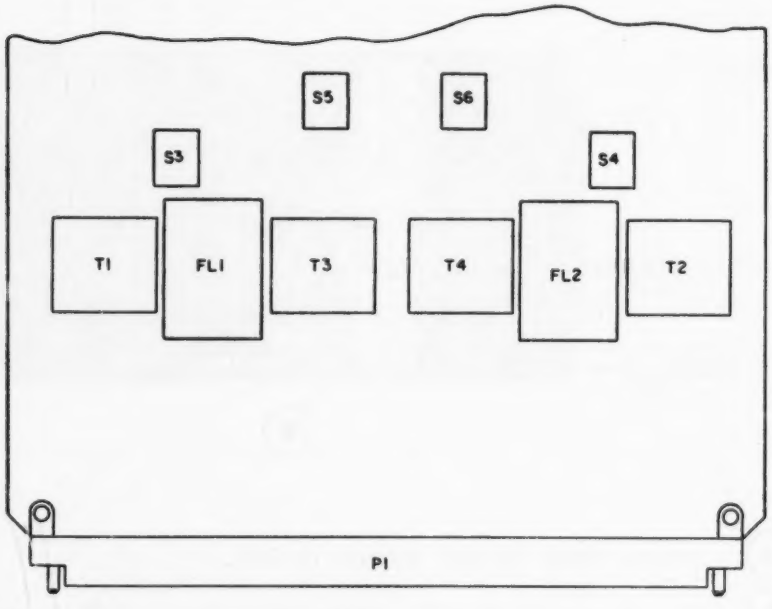
CHAN XMIT GAIN S3, S4 — Selects required OUTPUT gain for cable attenuation.

Position	Setting Data	Test Tone Level
1	-3 dB	-20 dBm
2	0 dB	-17 dBm
3	+10 dB	-7 dBm
4	+20 dB	+3 dBm

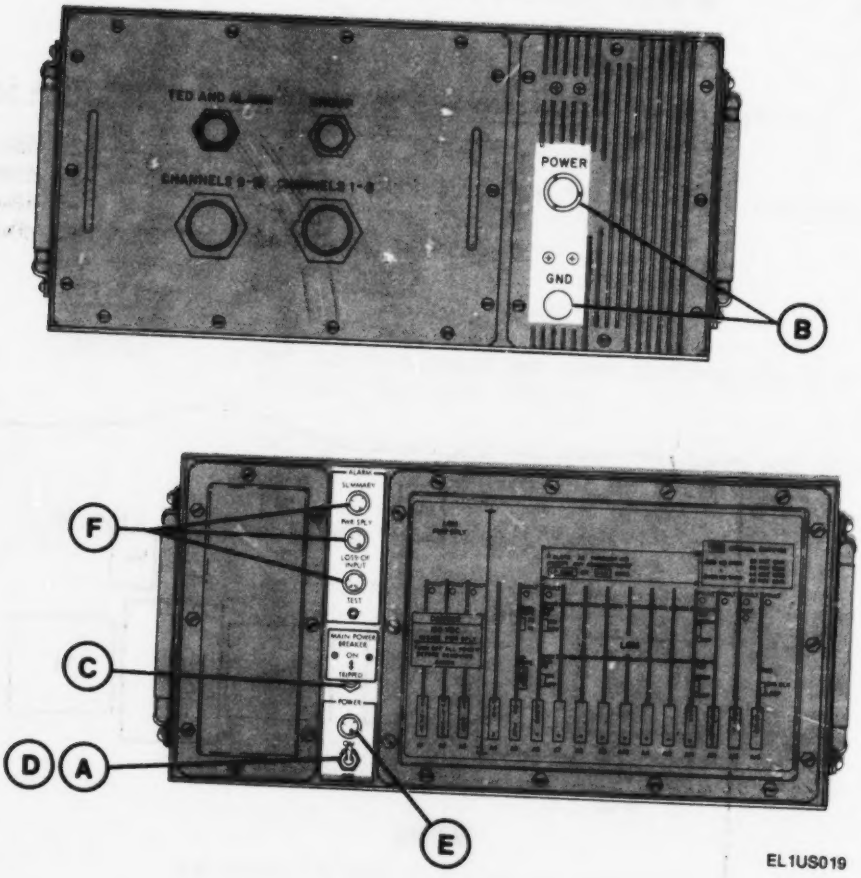
2-6. RESETTING CCA SWITCHES—Continued

Switch Name	Function
CHAN RCV GAIN S5, S6	Selects required INPUT gain for cable attenuation.

Position	Setting Data	Test Tone Level
1	+3 dB	-20 dBm
2	0 dB	-17 dBm
3	-10 dB	-7 dBm
4	-20 dB	+3 dBm



2-7. EQUIPMENT TURNON



EL1US019

(A) Insure POWER ON/OFF switch is OFF.

(B) Insure power cable is connected. Insure LGM is grounded.

(C) Insure MAIN POWER BREAKER is ON.

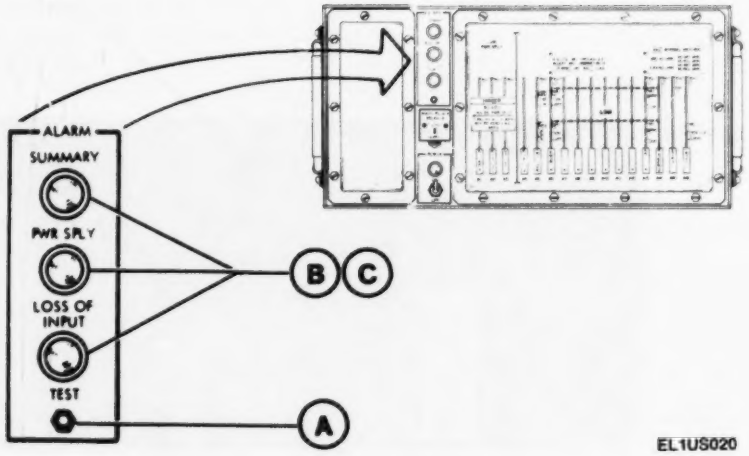
(D) Set POWER ON/OFF switch to ON.

(E) POWER lamp lights.

(F) After 5-second warmup, these ALARM lamps should be off. If not, see Chapter 4, Section IV, Troubleshooting

2-8. OPERATOR CHECKS

The only operator check required is a BITE test. System must be operating.

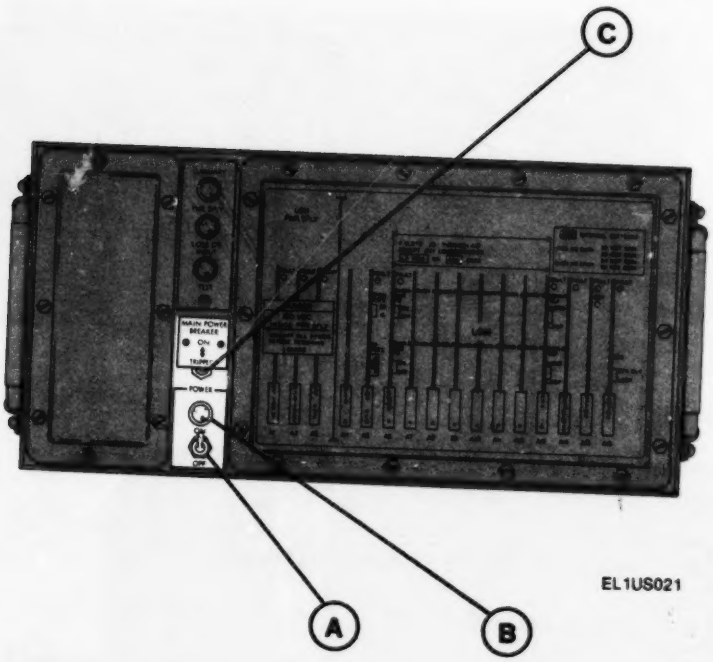


(A) Press ALARM TEST pushbutton.

(B) Lamps should light.

(C) If any lamp fails to light, refer to organizational level maintenance.

2-9. EQUIPMENT TURNOFF



(A) Set POWER ON/OFF switch to OFF.

(B) POWER lamp goes off.

(C) Leave MAIN POWER BREAKER ON.

Section IV. OPERATION UNDER UNUSUAL CONDITIONS

2-10. OPERATING IN UNUSUAL WEATHER

Although intended for use inside a heated/air-conditioned shelter, the LGM will operate in the following environments:

a. Arctic Climate.

- The LGM operates at temperatures down to -25°F (-32°C) and can be stored at temperatures down to -70°F (-57°C).
- Extreme cold causes components, especially cables and plastic components, to become brittle. Permanent damage can result from mechanical shock to components. Cables can break if kinked or bent.
- When cold equipment is brought into a warm room, moisture will condense on its surfaces. Before operation, allow equipment to warm to room temperature, then dry thoroughly with cloth.

b. Tropical Climate.

- The LGM operates at temperatures as high as +145°F (+63°C) and can be stored at temperatures as high as +160°F (+71°C).
- Extreme heat and humidity can cause moisture and fungus growth which can cause improper operation. Keep cover on as much as possible and ventilate the equipment as often as possible.

c. Desert Climate.

- The LGM operates at temperatures up to +145°F (+63°C) and can be stored at temperatures up to +160°F (+71°C).
- Windblown sand, dirt, or dust will damage the equipment. Keep cover on as much as possible.

d. Salt Air.

- Salt air can corrode the connectors and controls on the LGM. Keep cover on as much as possible and clean surfaces with damp cloth (fresh water).

2-10. OPERATING IN UNUSUAL WEATHER—Continued

e. High Altitudes.

- The LGM can operate at altitudes up to 10,000 feet and can be stored at altitudes up to 40,000 feet.

2-11. ELECTRICAL INTERFERENCE

Observe the following guidelines to minimize electrical interference caused by external sources:

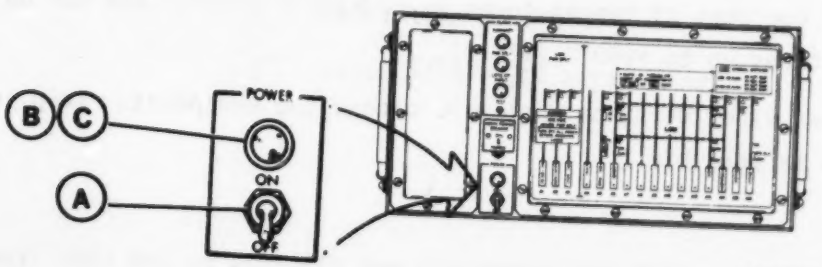
a. Keep ground connections secure.
b. Keep cable connections secure.
c. Keep captive screws on the CCA covers secure.

2-12. EMERGENCY PROCEDURES

NOTE

Any shelter or facility circuit breaker controlling power to the LGM may control power to other equipment. Assure that the emergency warrants turning off the other equipment before operating this circuit breaker.

a. Emergency Turnoff. There are no special emergency turnoff procedures. In an emergency, perform the following:



EL1US022

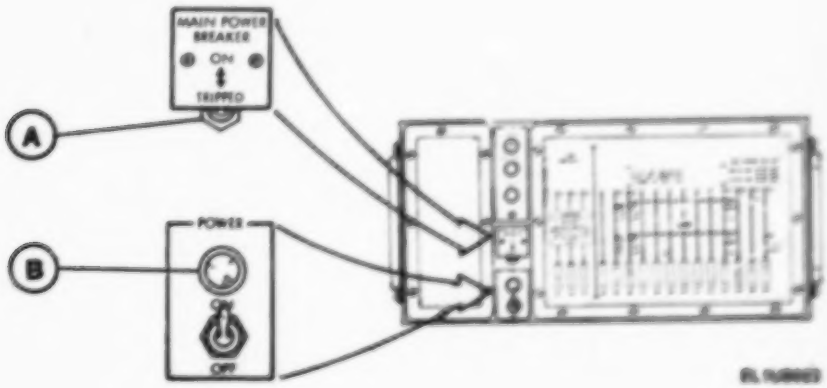
2-12. EMERGENCY PROCEDURES—Continued

(A) Quickly set POWER ON/OFF switch to OFF.

(B) POWER indicator lamp should go out.

(C) If POWER indicator fails to go out, trip external circuit breaker supplying facility power to the LGM.

b. Power Transients. If power to the LGM varies widely, MAIN POWER BREAKER may trip. If this occurs:



(A) Set MAIN POWER BREAKER to ON.

(B) POWER indicator lamp should light.

CHAPTER 3
OPERATOR MAINTENANCE

For the purpose of this manual, crew and operator maintenance are one and the same.

CHAPTER 4
ORGANIZATIONAL MAINTENANCE

		Page
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Section II	Service Upon Receipt	4-2
4-4	Unpacking	4-3
4-5	Checking Unpacked Equipment	4-4
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Section I. REPAIR PARTS; SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT

4-1. COMMON TOOLS AND EQUIPMENT

For authorized common tools and equipment, refer to the Modified Table of Organization and Equipment (MTOE) applicable to your unit. For Air Force, refer to appropriate Table of Allowances.

4.2. SPECIAL TOOLS, TMDE, AND SUPPORT EQUIPMENT

For Repair Parts and Special Tools List (RPSTL), refer to TM 11-5805-696-24P (Army) or TO 31W2-2G-32 (USAF). Maintenance tools and equipment as authorized by the Maintenance Allocation Chart (refer to Appendix B, MAC) for organizational maintenance are as follows:

Tool Kit, Electronic Equipment, TK-101/G, 1 each

4-3. REPAIR PARTS

Repair parts are listed and illustrated in the RPSTL (TM 11-5805-696-24P) covering operator and organizational maintenance for the LGM. For Air Force, refer to TO 31W2-2G-354.

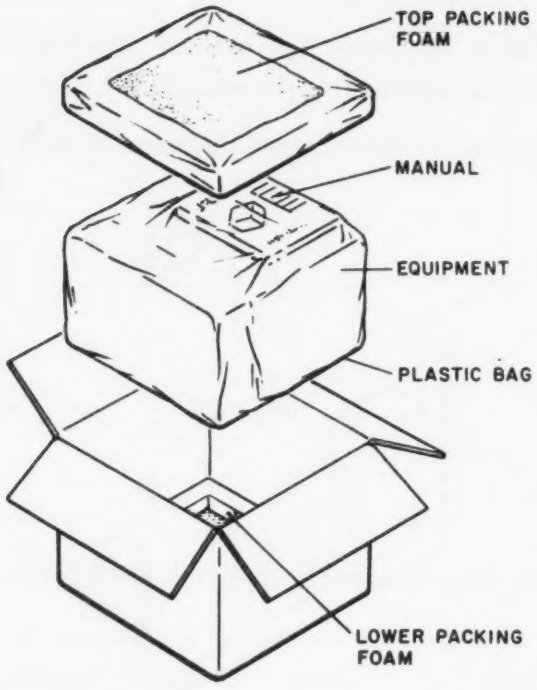
Section II. SERVICE UPON RECEIPT

WARNING

HEAVY EQUIPMENT

This equipment weighs over 35 pounds and can cause serious injury if lifted or carried alone. Do not attempt to lift, carry, or move the equipment by yourself -- use at least two persons.

4-4. UNPACKING



a. Open.

- Use sharp knife to cut reinforcing tape on top of carton.
- Open top of box.

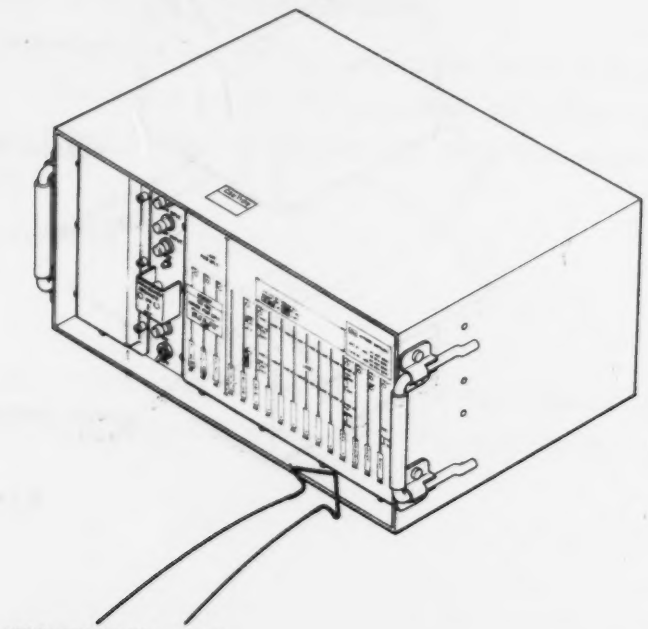
b. Remove LGM.

- Lift out top packing.
- Lift out equipment including manual.
- Use sharp knife to slit plastic bag.
- Remove manual and equipment, with bag of hardware attached.

4-5. CHECKING UNPACKED EQUIPMENT

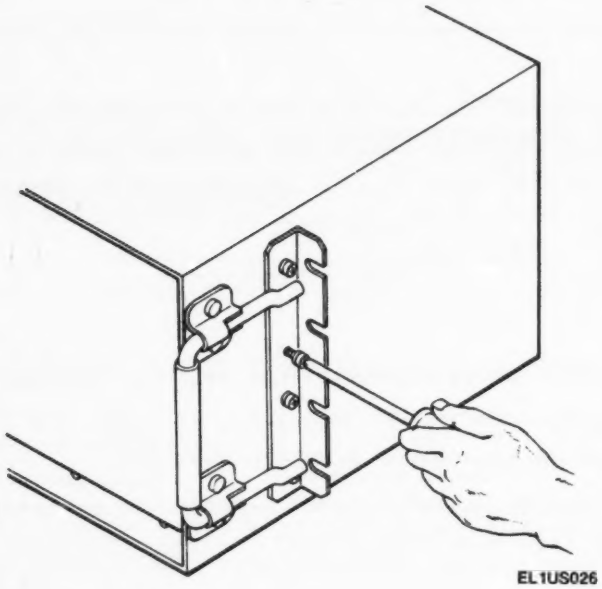
a. Damage. Inspect the equipment for damage incurred during shipment. If equipment has been damaged, report the damage on SF 364 (Report of Discrepancy (ROD)). For Air Force, use DD Form 173 (Material Deficiency Report (Catagory 1)).

b. Packing Slip. Check equipment against the packing slip to see if shipment is complete. Report all discrepancies in accordance with the instructions of DA Pam 738-750 as contained in Maintenance Management Update.



c. Modifications. Check DA Pam 310-1, Consolidated Index of Army Publications and Blank Forms, for Modification Work Orders (MWO) applicable to this equipment. Compare MWO number (if any) obtained from DA Pam 310-1 with that on equipment. If numbers disagree, equipment must be modified.

4-6. INSTALLATION OF MOUNTING BRACKETS



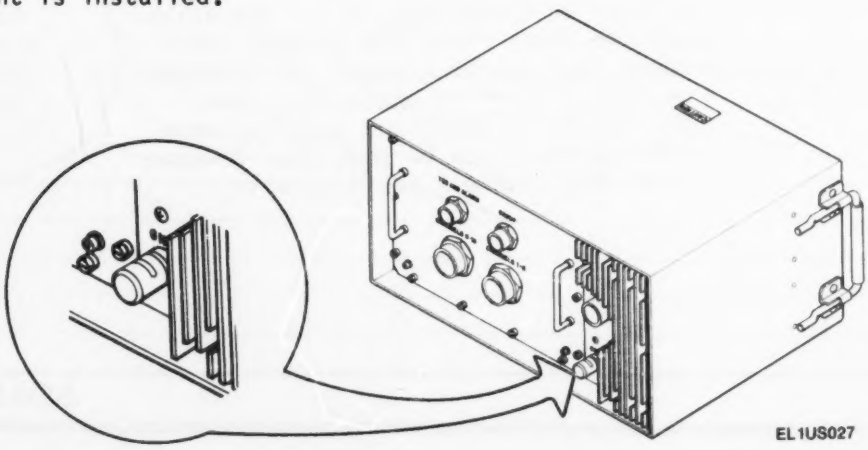
EL1US026

a. Remove mounting brackets and attaching hardware from bag.

b. Install one mounting bracket to each side of equipment case using No. 2 Phillips screwdriver, four screws and four flat washers.

4-7. GROUNDING

A ground wire should be attached to ground lug and rear of LGM, and remain in place while equipment is installed.



EL1US027

Section III. ORGANIZATIONAL PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

4-8. GENERAL

To be sure that your equipment is always ready for your mission, you must do scheduled preventive maintenance checks and services (PMCS). When you are doing any PMCS or routine checks, keep in mind WARNINGS and CAUTIONS about electrical shock and bodily harm.

4-9. PMCS TABLE

A PMCS table for Multiplexer TD-1235(P)/TTC appears at the end of this section. There is one category or interval of PMCS: B. It heads the INTERVAL column of the PMCS table. A dot in the INTERVAL column indicates the check and/or service that should be performed by organizational maintenance personnel at a particular time.

a. B stands for before. B - PMCS should be performed before operation to make sure your equipment is ready to go.

NOTE

Use your PMCS table to get the number for the TM ITEM NO. column of DA Form 2404 (Equipment Inspection and Maintenance Worksheet).

NOTE

If your equipment must be in operation all the time, check and service those items that can be checked and serviced without disturbing operation. Make the complete checks and services when the equipment can be shut down or when orderwire channels are available.

4-9. PMCS TABLE—Continued

DA FORM 2404, EQUIPMENT INSPECTION AND MAINTENANCE WORKSHEET.

EQUIPMENT INSPECTION AND MAINTENANCE WORKSHEET

For use of this form, see TM 38-750; the proponent agency is the Office of the Deputy Chief of Staff for Logistics.

1. ORGANIZATION	2. NOMENCLATURE AND MODEL					
126 Signal Company, Fort Myer, VA						
3. REGISTRATION/SERIAL/FSN	4a. MILES	b. HOURS	c. ROUNDS FIRED	d. HOT STARTS	5. DATE	6. TYPE INSPECTION
					13 Jun	PMCS

7. APPLICABLE REFERENCE

TM NUMBER	TM DATE	TM NUMBER	TM DATE

INSTRUCTIONS - Perform each check listed in the TM applicable to the inspection performed. Following the sequence listed in pertinent TM, complete form as follows:

COLUMN a - Enter TM item number.

COLUMN b - Enter the applicable condition status symbol.

COLUMN c - Enter deficiencies and shortcomings.

COLUMN d - Show corrective action for deficiency or shortcoming listed in Column c.

COLUMN e - Individual ascertaining completed corrective action initial in this column.

ALL INSPECTIONS AND EQUIPMENT CONDITIONS RECORDED ON THIS FORM HAVE BEEN DETERMINED IN ACCORDANCE WITH DIAGNOSTIC PROCEDURES AND STANDARDS IN THE TM CITED HEREON.

8a. SIGNATURE (Person(s) performing inspection)	8b. TIME	9a. SIGNATURE (Maintenance Supervisor)	9b. TIME	10. MANHOURS REQUIRED
Joseph D. Slatter	0920 hours			

TM ITEM NO. a	STATUS b	DEFICIENCIES AND SHORTCOMINGS c	CORRECTIVE ACTION d	INITIAL WHEN CORRECTED e
11		Power indicator lamp failed to light.	Replaced bulb.	J.D.L

USE PMCS ITEM NO.

DA FORM 1 JAN 64 2404

EL1US016

4-9. PMCS TABLE—Continued

b. Whenever an equipment is reinstalled after removal for any reason, perform the necessary B - PMCS to be sure that the item meets the readiness reporting criteria.

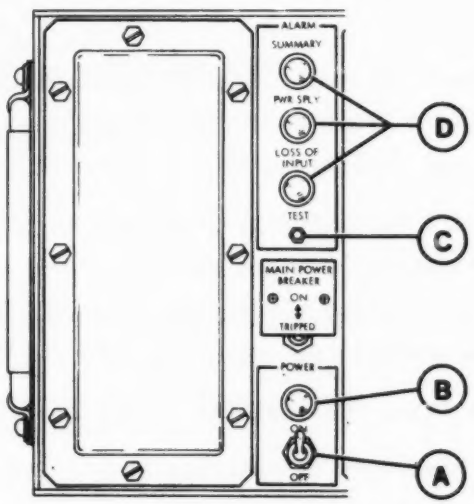
c. Routine checks are not listed as PMCS checks. The following are some of the routine checks:

- Checking for frayed cables
- Storing items not in use
- Covering unused receptacles
- Checking for loose nuts, bolts, and screws
- Cleaning
- Dusting
- Washing

d. You should perform routine checks as the need comes up.

4-9. PMCS TABLE—Continued

PMCS TABLE

ITEM NO.	INTERVAL B	ITEM TO BE INSPECTED	PROCEDURES CHECK AND HAVE REPAIRED OR ADJUSTED AS NECESSARY.
			 EL1US017
1	•	POWER ON	(A) Set POWER ON/OFF switch to ON. (B) POWER lamp lights.
2	•	BITE Test	(C) Press ALARM TEST switch (D) ALARM SUMMARY, PWR SPLY, and LOSS OF INPUT lamps light.

Section IV. TROUBLESHOOTING

4-10. TROUBLESHOOTING PROCEDURE

Troubleshooting the LGM is normally initiated by the maintenance supervisor system control point. A probable malfunction in the LGM is identified by the system control point personnel, who interpret equipment fault alarm indicators on the system status console. Upon diagnosing a probable fault to the LGM, the system control point so notifies the organization, which then uses the following flowcharts.

The flowchart information is based on visual symptoms obtained from the LGM BITE lamps. Before troubleshooting, check that all CCA switches are set as directed by the system control point.

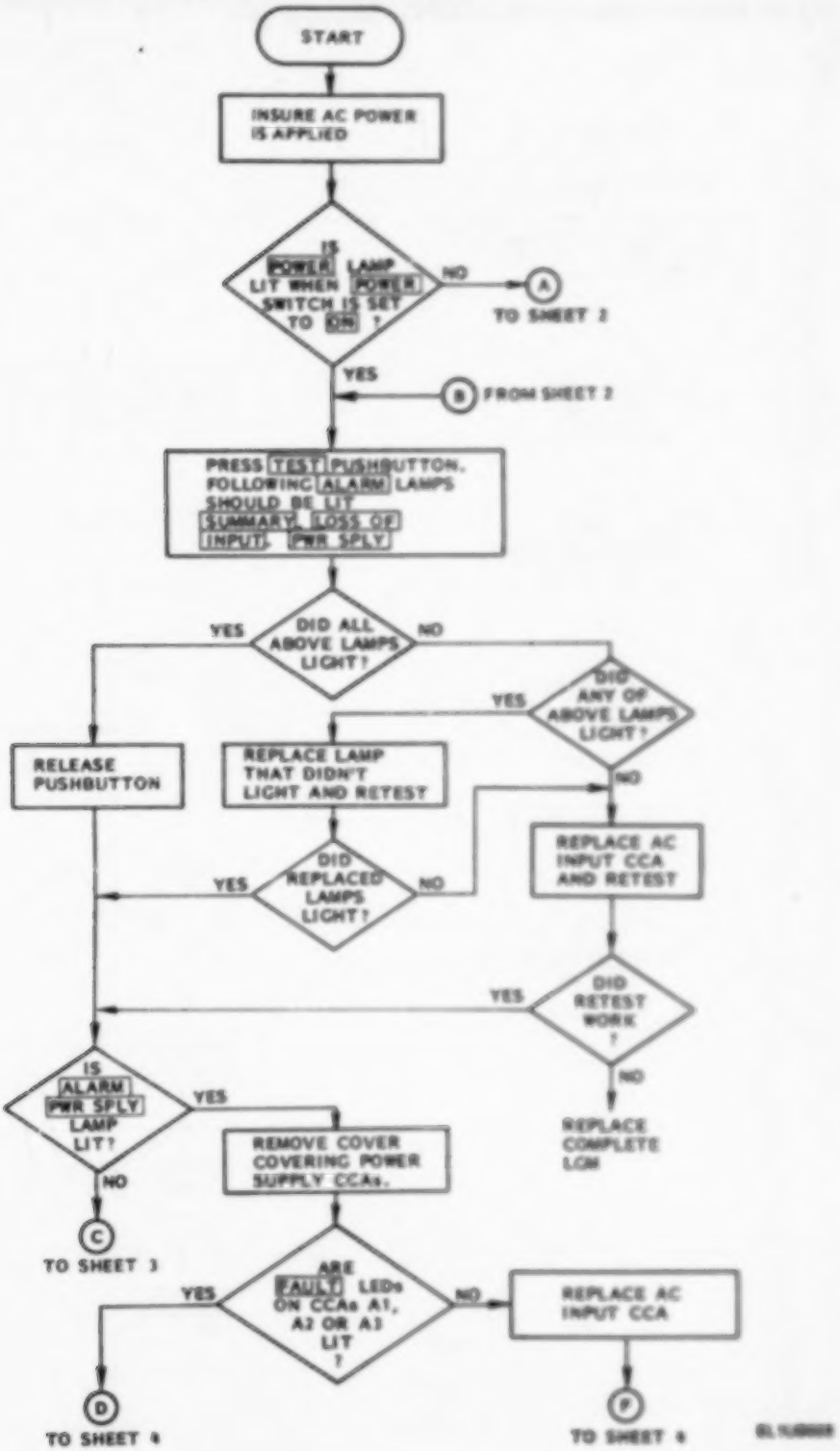
The flowchart is a step-by-step path through the LGM. All decisions are made in the diamond shaped (◇) boxes and require a yes or no answer. All instructions are given in the rectangular shaped boxes (▭) and must be accomplished before moving on with the procedure. When the word END is reached, the fault should be corrected.

When replacing a CCA that has settable switches:

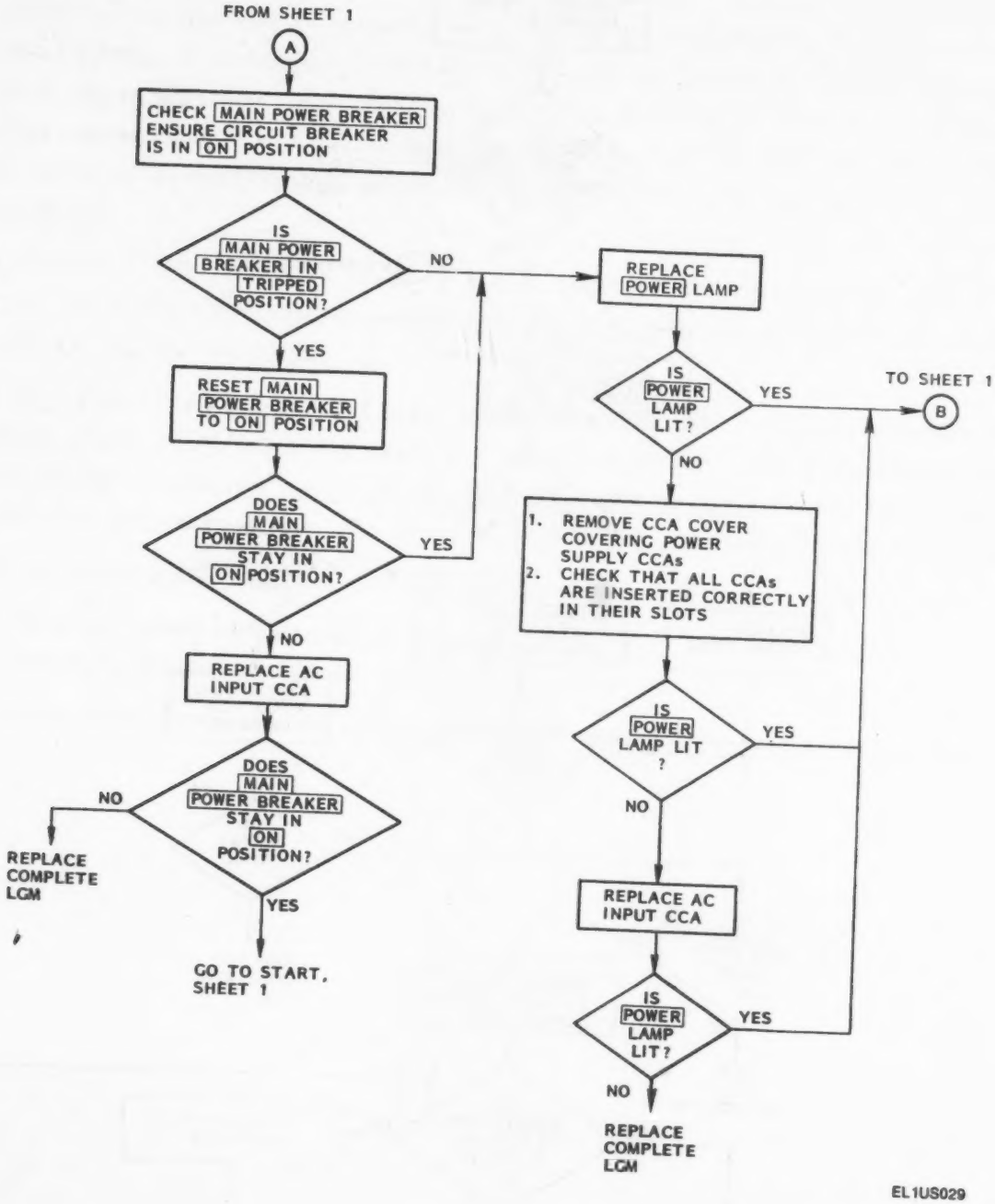
- Note positions of switches on old CCA.
- Set switches on new CCA in same positions.

If faults occur during system setup, check that all switches are properly set.

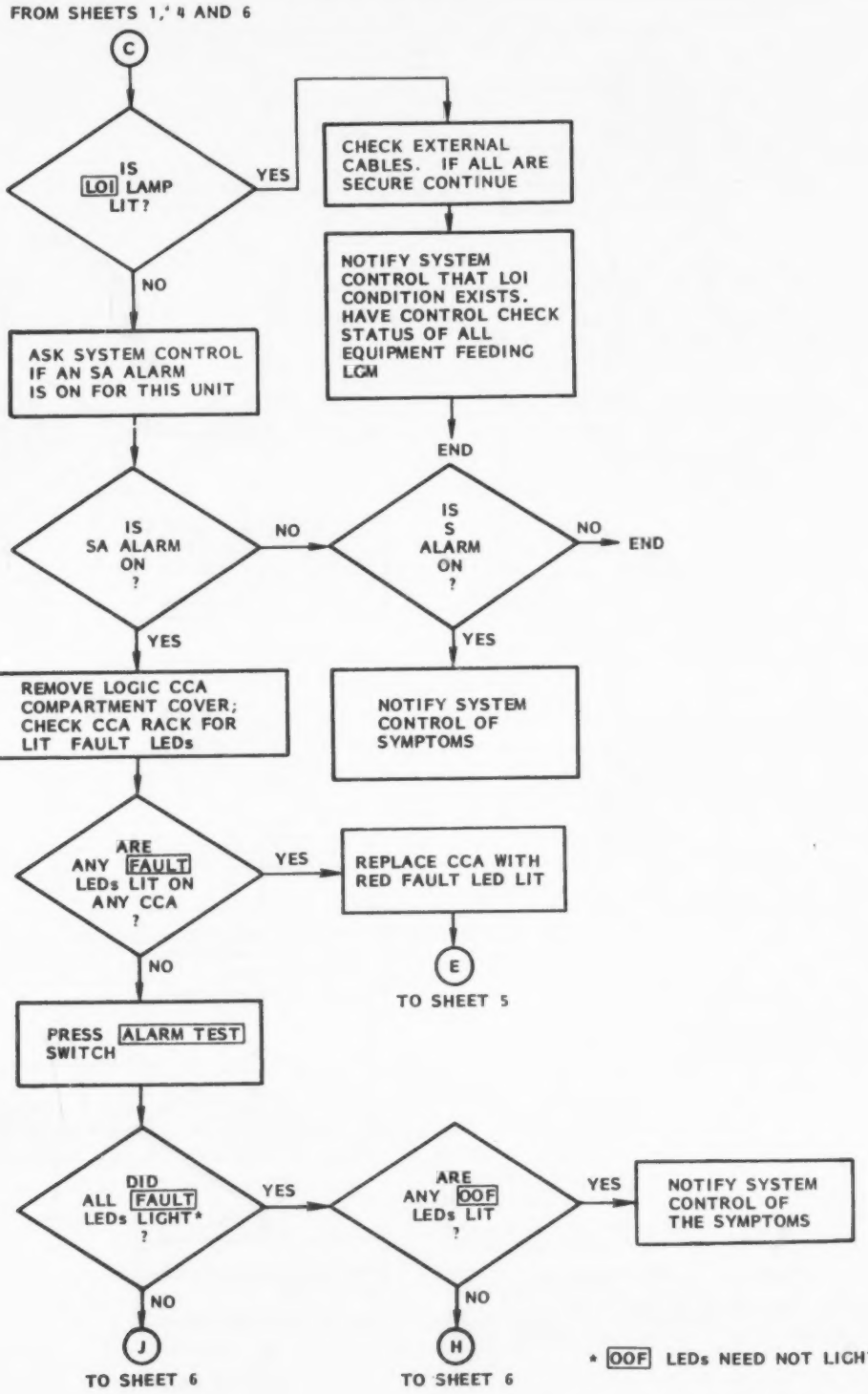
4-11. TROUBLESHOOTING FLOWCHART—Sheet 1 of 6



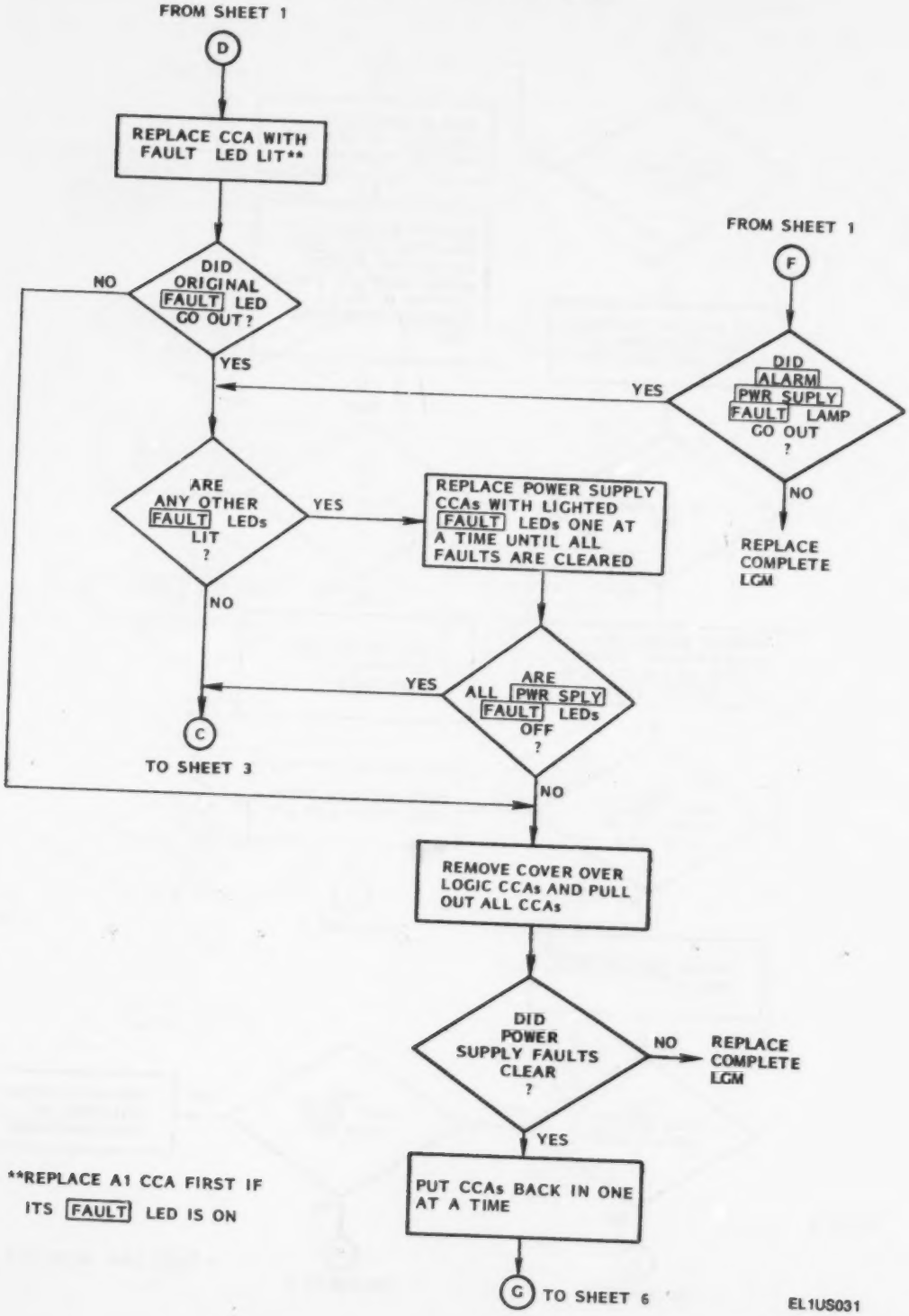
4-11. TROUBLESHOOTING FLOWCHART—Sheet 2 of 6



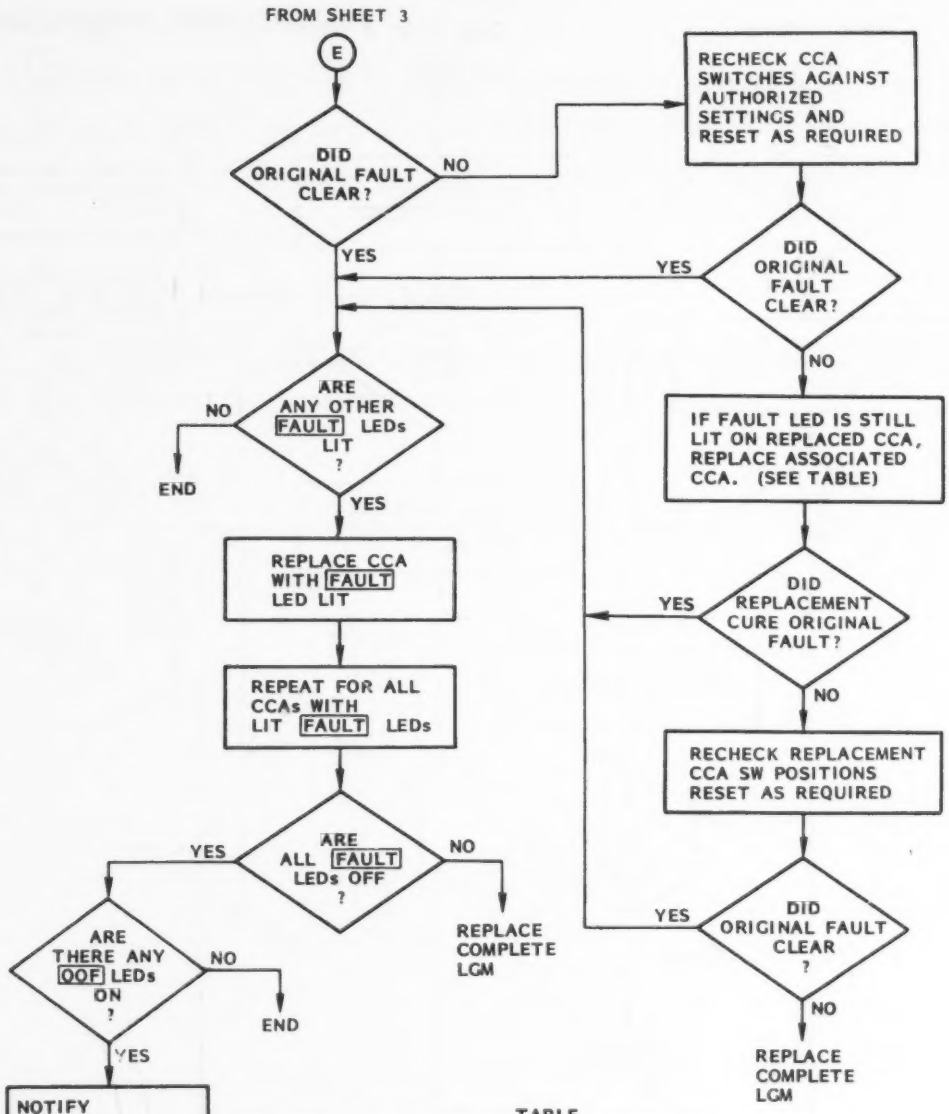
4-11. TROUBLESHOOTING FLOWCHART—Sheet 3 of 6



4-11. TROUBLESHOOTING FLOWCHART—Sheet 4 of 6



4-11. TROUBLESHOOTING FLOWCHART—Sheet 5 of 6

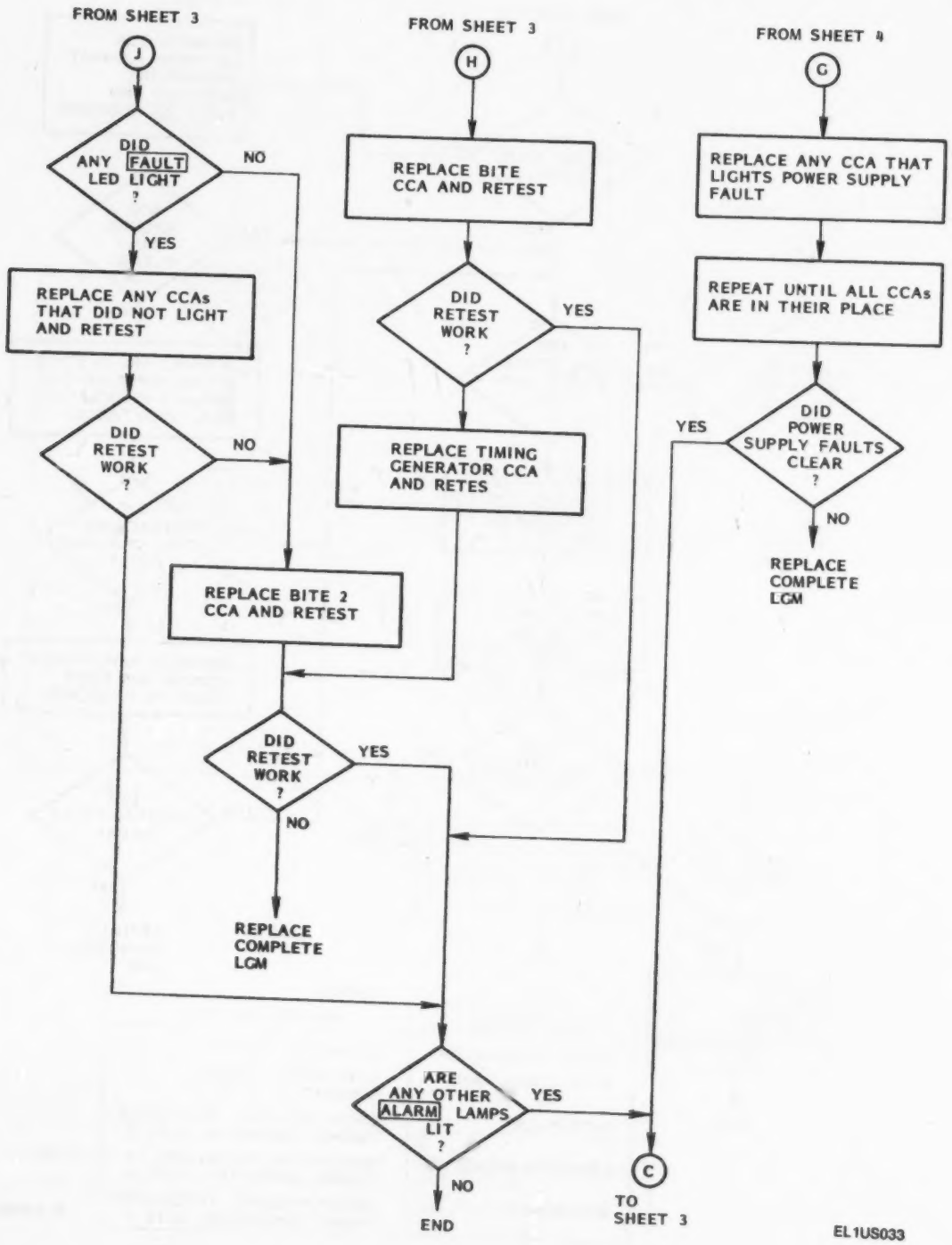


TABLE

CCA REPLACED	ASSOCIATED CCA
TIMING GENERATOR	INTERFACE, BITE 2
LOOP MODEM, AAU	MUX/DEMUX, TIMING GENERATOR, BITE 2
INTERFACE	GROUP FRAMING, MUX/DEMUX, TIMING GENERATOR, BITE 2
GROUP FRAMING	MUX/DEMUX, INTERFACE, TIMING GENERATOR, BITE 2
MUX/DEMUX	GROUP FRAMING, INTERFACE, TIMING GENERATOR, BITE 2

EL1US032

4-11. TROUBLESHOOTING FLOWCHART—Sheet 6 of 6



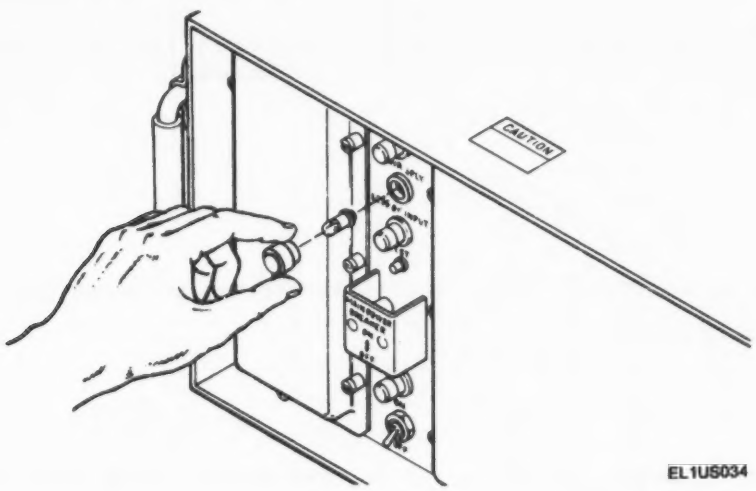
Section V. MAINTENANCE PROCEDURES

4-12. ORGANIZATIONAL MAINTENANCE

Organizational corrective maintenance of the LGM consists of removing and replacing those items found to be defective during troubleshooting. These procedures are limited to removal and replacement of lamp bulbs, cover assemblies, and circuit card assemblies.

4-13. REMOVAL AND REPLACEMENT OF LAMPS

Only the lamps for the SUMMARY, PWR SPLY, LOSS OF INPUT, and POWER lights are replaceable at the organizational maintenance level.



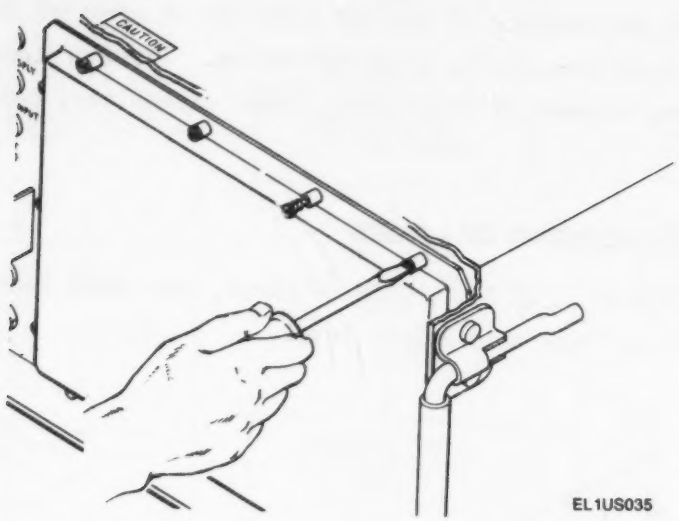
REMOVAL

1 Turn lens assembly counterclockwise and remove.
2 Pull lamp loose from lens assembly and remove.

REPLACEMENT

1 Press new lamp into lens assembly.
2 Reinstall lens assembly and turn clockwise to secure.

4-14. REMOVAL AND REPLACEMENT OF LOGIC CCA COMPARTMENT COVER ASSEMBLY



REMOVAL

- Using flat blade screwdriver, loosen 14 captive screws securing CCA cover assembly and remove cover.

REPLACEMENT

- Install CCA cover assembly and secure 14 captive screws using flat blade screwdriver. Do not overtighten.

4-15. REMOVAL AND REPLACEMENT OF LOGIC CCAs

CAUTION

Static discharge can damage microcircuit components on CCAs. To avoid this damage, observe the following:

(1) Handle CCAs by their edges only.

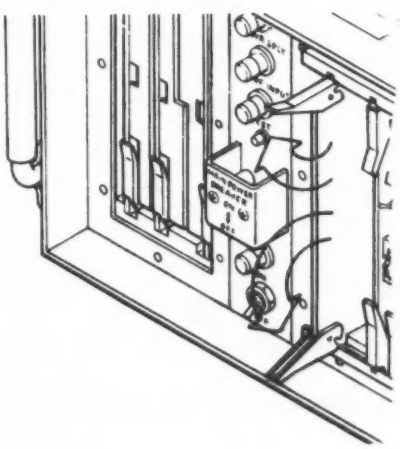
(2) Do not wrap, store, or ship CCAs in plastic bags; use containers made of heavy paper or aluminum foil.

(3) Do not rub CCAs against clothing or wipe with a cloth made with synthetic fibers (plastic, acrylic, nylon, etc.).

PRELIMINARY PROCEDURES

- Remove logic CCA compartment cover in accordance with paragraph 4-14.

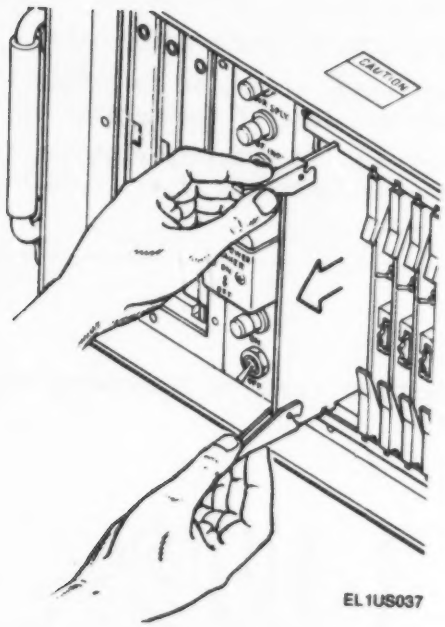
REMOVAL



EL1US036

1 Swing out both levers on card at the same time to disengage card from connector.

4-15. REMOVAL AND REPLACEMENT OF LOGIC CCAs—Continued



2 Carefully pull out card.

3 Note positions of any CCA switches.

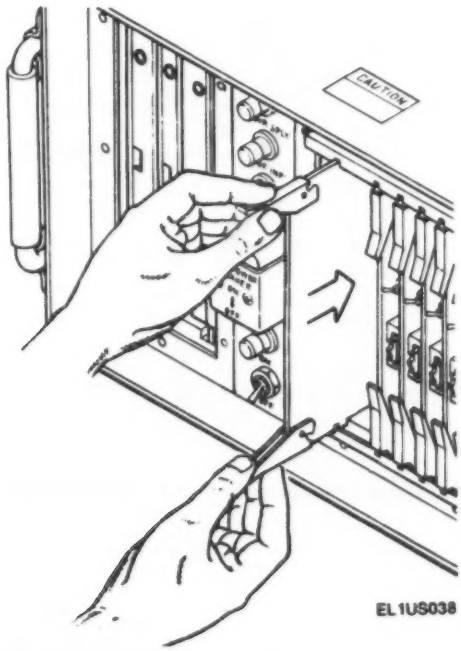
4 Set any switches on replacement CCA to same positions noted on removed CCA.

4-15. REMOVAL AND REPLACEMENT OF LOGIC CCAs—Continued

REPLACEMENT

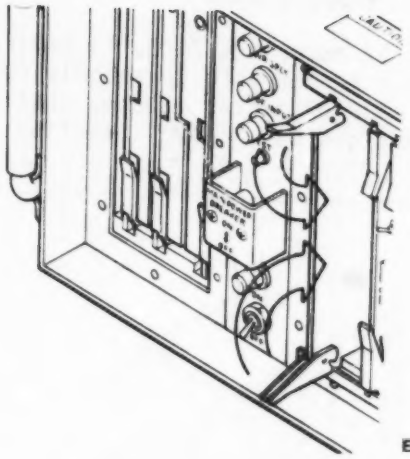
CAUTION

Damage will result if excessive force is used to insert cards. If cards cannot be inserted with reasonable force, ensure card identification on card extractor matches that on slot. Ensure that levers are straight out before insertion.



1 Aline card in slot and carefully push in. As card begins to engage, levers will begin to move in.

4-15. REMOVAL AND REPLACEMENT OF LOGIC CCAs—Continued



EL1US039

2 When card is properly in place, swing in both levers at the same time to engage card in connector.

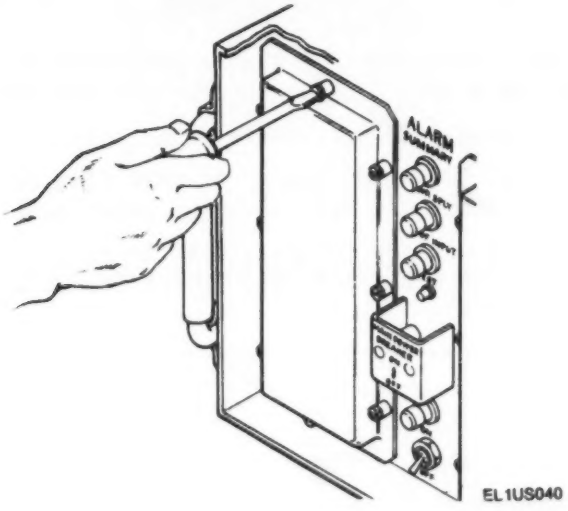
3 Replace logic CCA compartment cover in accordance with paragraph 4-14.

4-16. REMOVAL AND REPLACEMENT OF POWER SUPPLY CCA COMPARTMENT COVER ASSEMBLY

WARNING

HIGH VOLTAGE

The high voltage used in this equipment can kill on contact. Ground the equipment. Avoid the 115-volt ac input. Do not service alone. Where possible, use one hand to service.



REMOVAL

- Using flatblade screwdriver loosen eight captive screws securing CCA cover assembly and remove cover.

REPLACEMENT

- Install CCA cover assembly and secure eight captive screws using flatblade screwdriver. Do not overtighten.

4-17. REMOVAL AND REPLACEMENT OF POWER SUPPLY CCAs

WARNING

HIGH VOLTAGE

The high voltage used in this equipment can kill on contact. Ground the equipment. Avoid the 115-volt ac input. Do not service alone. Where possible, use one hand to service.

CAUTION

Static discharge can damage microcircuit components on CCAs. To avoid this damage, observe the following:

(1) Handle CCAs by their edges only.

(2) Do not wrap, store, or ship CCAs in plastic bags; use containers made of heavy paper or aluminum foil.

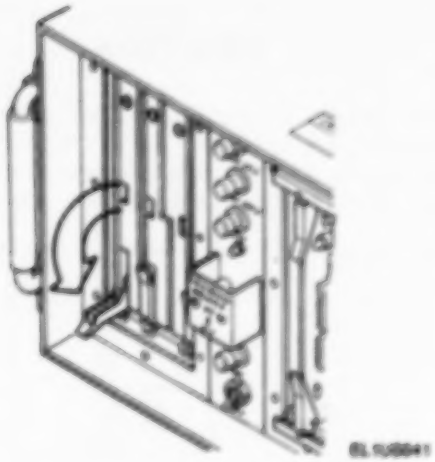
(3) Do not rub CCAs against clothing or wipe with a cloth made with synthetic fibers (plastic, acrylic, nylon, etc.).

PRELIMINARY PROCEDURES

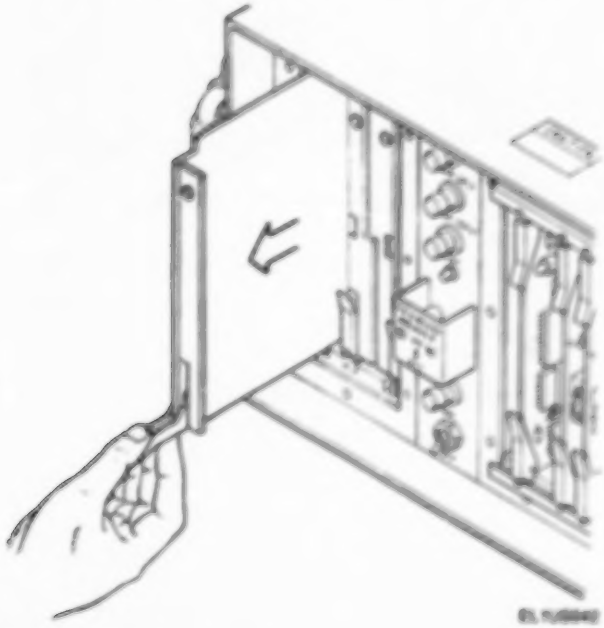
- Set front panel POWER ON/OFF switch to OFF.
- Remove power supply CCA cover in accordance with paragraph 4-16.

4-17. REMOVAL AND REPLACEMENT OF POWER SUPPLY CCAs—Continued

REMOVAL



1 Swing out lever on bottom of card to disengage card from connector.



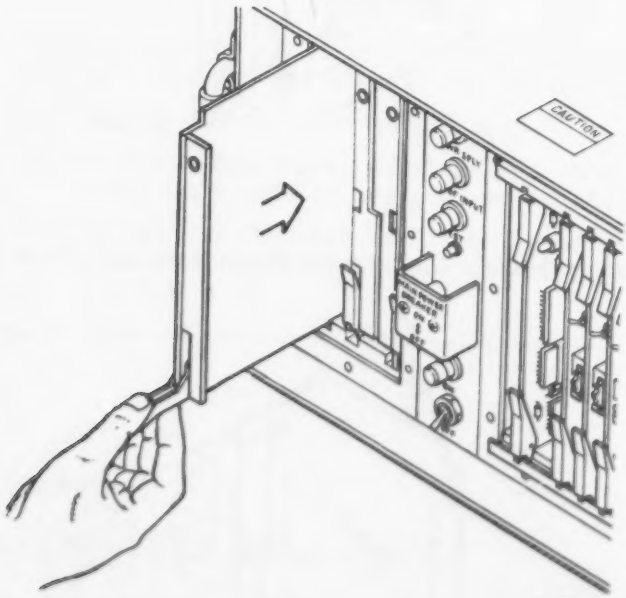
2 Carefully pull out card.

4-17. REMOVAL AND REPLACEMENT OF POWER SUPPLY CCAs—Continued

REPLACEMENT

CAUTION

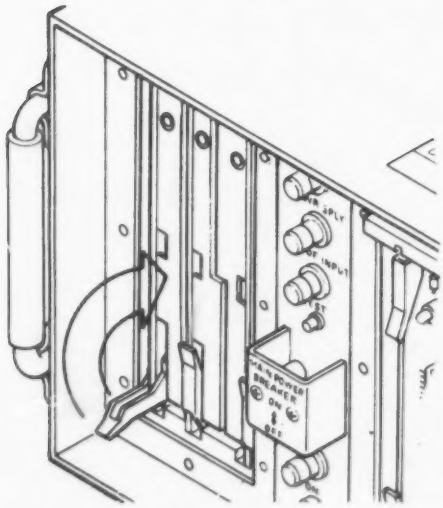
Damage will result if excessive force is used to insert cards. If cards cannot be inserted with reasonable force, ensure card identification on card extractor matches that on slot. Ensure that levers are straight out before insertion.



EL1UB043

1 Aline card in slot and carefully push in.

4-17. REMOVAL AND REPLACEMENT OF POWER SUPPLY CCAs—Continued



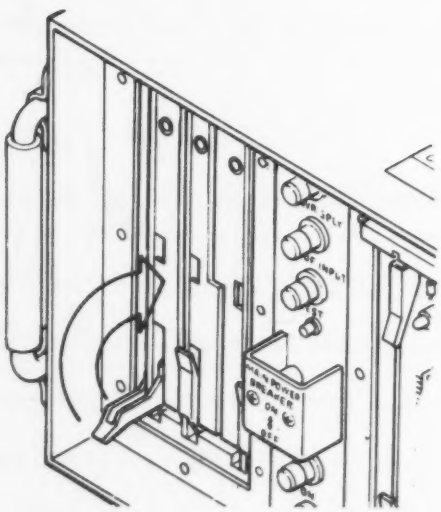
EL1US044

2 Ensure CCA is properly seated and swing in lever.

3 Replace power supply CCA compartment cover in accordance with paragraph 4-16.

4 Set front panel POWER ON/OFF switch to ON.

4-17. REMOVAL AND REPLACEMENT OF POWER SUPPLY CCAs—Continued



EL1US044

2 Ensure CCA is properly seated and swing in lever.

3 Replace power supply CCA compartment cover in accordance with paragraph 4-16.

4 Set front panel POWER ON/OFF switch to ON.

APPENDIX A
REFERENCES

A-1. SCOPE

This appendix lists all forms, technical publications, and miscellaneous publications referenced in the manual.

A-2. FORMS

Technical Order System Publication Improvement Report and Reply ..... AFTO Form 22

Recommended Changes to Publications and Blank Forms ..... DA Form 2028

Recommended Changes to Equipment Technical Publications ... DA Form 2028-2

Equipment Inspection and Maintenance Worksheet ..... DA Form 2404

Discrepancy in Shipment Report (DISREP) ..... SF 361

Report of Discrepancy (ROD) ..... SF 364

Material Deficiency Report (Category 1) ..... DA Form 173

Ouality Deficiency Report (Category 2) ..... SF 368

A-3. TECHNICAL MANUALS

Procedures for Destruction of Electronic Materiel to Prevent Enemy Use (Electronics Command) ..... TM 750-244-2

Organizational, Direct Support, and General Support Maintenance Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools) for Multiplexer TD-1235(P)/TTC (NSN 5820-01-145-2460) ..... TM 11-5805-696-24P

A-4. REGULATIONS

Report of Transportation Discrepancies in Shipments ..... AR 55-38

Reporting of Item and Packaging Discrepancies ..... AR 735-11-2

A-5. MISCELLANEOUS PUBLICATIONS

Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items)	CTA 50-970
Consolidated Index of Army Publications and Blank Forms ...	DA Pam 310-1
The Army Maintenance Management System (TAMMS)	DA Pam 738-750
Federal Supply Code for Manufacturers (FSCM)	SB 708-42

APPENDIX B
MAINTENANCE ALLOCATION

Section I. INTRODUCTION

B-1. GENERAL

a. This section provides a general explanation of all maintenance and repair functions authorized at various maintenance categories.

b. The Maintenance Allocation Chart (MAC) in Section II designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component will be consistent with capacities and capabilities of the designated maintenance categories.

c. Section III lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from Section II.

d. Section IV contains supplemental instructions and explanatory notes for a particular maintenance function.

B-2. MAINTENANCE FUNCTIONS

Maintenance functions will be limited to and defined as follows:

a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel).

b. Test. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases.

d. Aline. To adjust specified variable elements of an item to bring about optimum or desired performance.

e. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments or test measuring and diagnostic equipments used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.

B-2. MAINTENANCE FUNCTIONS—Continued

f. Remove/Install. To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow proper functioning of an equipment or system.

g. Replace. To remove an unserviceable item and install a serviceable counterpart in its place. "Replace" is authorized by the MAC and is shown as the third position code of the SMR code.

h. Repair. The application of maintenance services including fault location/troubleshooting removal/installation and disassembly/assembly procedures, and maintenance actions to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

i. Overhaul. That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/operational condition as required by maintenance standards in appropriate technical publications (i.e., DMWR). Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like-new condition.

j. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like-new condition in accordance with original manufacturing standards. Rebuild is the highest degree of material maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (hours/miles, etc.) considered in classifying Army equipment/components.

B-3. EXPLANATION OF COLUMNS IN THE MAC, SECTION II

a. Column 1, Group Number. This column lists functional group code numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the next higher assembly. End item group number shall be "00".

b. Column 2, Component/Assembly. This column contains the names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

c. Column 3, Maintenance Function. This column lists the functions to be performed on the item listed in column 2. (For detailed explanation of these functions, see paragraph B-2.)

d. Column 4, Maintenance Category. This column specifies, by the listing of a work time figure in the appropriate subcolumn(s), the category of maintenance authorized to perform the function listed in column 3. This figure represents the active time required to perform that maintenance function at the indicated category of maintenance. If the number or complexity of the tasks within the listed maintenance function vary at different maintenance categories, appropriate work time

B-3. EXPLANATION OF COLUMNS IN THE MAC, SECTION II—Continued

figures will be shown for each category. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance/quality control time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the maintenance allocation chart. The symbol designations for the various maintenance categories are as follows:

C ..... Operator or Crew
O ..... Organizational Maintenance
F ..... Direct Support Maintenance
H ..... General Support Maintenance
D ..... Depot Maintenance

e. Column 5, Tools and Equipment. This column specifies, by code, those common tool sets (not individual tools) and special tools, TMDE, and support equipment required to perform the designated function.

f. Column 6, Remarks. This column shall, when applicable, contain a letter code, in alphabetic order, which shall be keyed to the remarks contained in Section IV.

B-4. EXPLANATION OF COLUMNS IN TOOL AND TEST EQUIPMENT REQUIREMENTS, SECTION III

a. Column 1, Reference Code. The tool and test equipment code correlates with a code used in the MAC, Section II, column 5.

b. Column 2, Maintenance Category. The lowest category of maintenance authorized to use the tool or test equipment.

c. Column 3, Nomenclature. Name or identification of the tool or test equipment.

d. Column 4, National Stock Number. The National Stock Number of the tool or test equipment.

e. Column 5, Tool Number. The manufacturer's part number.

B-5. EXPLANATION OF COLUMNS IN REMARKS, SECTION IV

a. Column 1, Reference Code. The code recorded in column 6, Section II.

b. Column 2, Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC, Section II.

Section II. MAINTENANCE ALLOCATION CHART FOR MULTIPLEXER TD-1235(P)/TTC

GROUP NUMBER	COMPONENT ASSEMBLY	MAINTENANCE FUNCTION	MAINTENANCE CATEGORY C	O	F	H	D	TOOLS AND TE	REMARKS
00	MULTIPLEXER TD-1235(P)/TTC (PN SM-D-876630)	INSPECT		1.10				10	A
		SERVICE		0.10				10	B
		REPAIR		2.40				09, 10	C
		INSPECT			0.60			11	A
		TEST			3.80			03, 05, 09, 11, 12, 13, 14, 30, 31, 32, 33	D
		REPAIR			1.60			03, 05, 09, 11, 12, 13, 14, 30, 31, 32, 33	E
		INSPECT				0.90		--	A
		TEST				2.70		02, 03 04, 05 11	H
		REPAIR				16.70		02, 03, 04, 05, 06, 11	G
		OVERHAUL					29.70	02, 03, 04, 05, 06, 07, 08, 09, 11, 12, 13, 20, 43, 47	F
01	AC INPUT CCA (PN SM-D-884579)	INSPECT		0.10				10	OT1
		REPLACE		0.20				10	OT2
		INSPECT				0.10		--	MT1
		TEST				0.30		02, 03, 05	MT3
		REPAIR				1.20		02, 03, 05, 06, 11	MT2
02	MULTI VDC CCA (PN SM-D-884567)	INSPECT		0.10				10	OT1
		REPLACE		0.20				10	OT2
		INSPECT				0.10		--	MT1
		TEST				0.30		02, 03, 05	MT3
		REPAIR				1.20		02, 03, 05, 06, 11	MT2
03	52 VDC CCA (PN SM-D-884571)	INSPECT		0.10				10	OT1
		REPLACE		0.20				10	OT2
		INSPECT				0.10		--	MT1
		TEST				0.30		02, 03, 05	MT3
		REPAIR				1.20		02, 03, 05, 06, 11	MT2

Section II. MAINTENANCE ALLOCATION CHART—Continued

GROUP NUMBER	COMPONENT ASSEMBLY	MAINTENANCE FUNCTION	MAINTENANCE CATEGORY C	O	F	H	D	TOOLS AND TE	REMARKS
04	BITE 2 CCA (PN SM-E-986241)	INSPECT		.10				10	OT1
		REPLACE		.20				10	OT2
		INSPECT				.10		--	HT1
		TEST				.30		02, 03, 05	HT3
		REPAIR				2.20		02, 03, 05, 06, 11	HT2
05	TIMING GENERATOR CCA (PN SM-E-986239)	INSPECT		.10				10	OT1
		REPLACE		.20				10	OT2
		INSPECT				.10		--	HT1
		TEST				.30		02, 03, 05	HT3
		REPAIR				2.10		02, 03, 05, 06, 11	HT2
06	LOOP MODEM CCA (PN SM-E-986235)	INSPECT		.10				10	OT1
		REPLACE		.20				10	OT2
		INSPECT				.10		--	HT1
		TEST				.30		02, 03, 05	HT3
		REPAIR				2.20		02, 03, 05, 06, 11	HT2
07	ANALOG APPLIQUE UNIT CCA (PN SM-D-959323)	INSPECT		.10				10	OT1
		REPLACE		.20				10	OT2
		INSPECT				.10		--	HT1
		TEST				.30		02, 03, 05	HT3
		REPAIR				2.20		02, 03, 05, 06, 11	HT2
08	MUX/DEMUX CCA (PN SM-E-986247)	INSPECT		.10				10	OT1
		REPLACE		.20				10	OT2
		INSPECT				.10		--	HT1
		TEST				.30		03, 04, 05	HT3
		REPAIR				2.10		03, 04, 05, 06, 11	HT2
09	GROUP FRAMING CCA (PN SM-E-986250)	INSPECT		.10				10	OT1
		REPLACE		.20				10	OT2
		INSPECT				.10		--	HT1
		TEST				.30		02, 03, 05	HT3
		REPAIR				2.20		02, 03, 05, 06, 11	HT2
10	INTERFACE CCA (PN SM-E-986264)	INSPECT		.10				10	OT1
		REPLACE		.20				10	OT2
		INSPECT					.10	--	OT1
		TEST					.20	03, 04, 05	OT4
		REPAIR					1.20	03, 04, 05, 06, 11	OT4

Section II. MAINTENANCE ALLOCATION CHART—Continued

GROUP NUMBER	COMPONENT ASSEMBLY	MAINTENANCE FUNCTION	MAINTENANCE CATEGORY C	O	F	H	D	TOOLS AND TE	REMARKS
11	CASE ASSEMBLY, ELECTRICAL EQPT. (PN SM-D-876678)	INSPECT			0.50			11	FT1
		TEST			0.30			03, 09, 11	FT2
		REPAIR			0.80			03, 11	FT3
		INSPECT					0.50	11	DT1
		TEST					1.60	03, 11	DT2
		REPAIR					2.10	03, 06, 07, 08, 11	DT3
1101	ELECTRONIC COMPONENTS ASSEMBLY (PN SM-D-959054)	INSPECT			0.10			11	FT1
		INSPECT					0.10	11	DT1
		REPAIR					0.70	03, 06, 08, 11	DT3
		TEST					0.20	03, 11	DT2
1102	CONNECTOR ASSEMBLY, REAR (PN SM-D-876683)	INSPECT			0.10			11	FT1
		TEST			0.30			03, 09, 11	FT2
		REPAIR			0.80			03, 11	FT3
		REPLACE			0.40			11	FT4
		INSPECT					0.10	11	DT1
		TEST					0.30	03	DT2
		REPAIR					0.80	03, 06, 08, 11	DT3
1103	CONNECTOR ASSEMBLY, ELECTRICAL (PN SM-D-876838)	INSPECT			0.10			11	FT1
		INSPECT					0.10	11	DT1
		REPAIR					0.60	03, 06, 07, 08, 11	DT3
		TEST					0.30	03, 11	DT2
1104	CONNECTOR ASSEMBLY, POWER SUPPLY (PN SM-D-984809)	INSPECT			0.10			11	FT1
		INSPECT					0.10	11	DT1
		REPAIR					0.60	03. 06, 08, 11	DT3
		TEST					0.30	03, 11	DT2

Section III. TOOL AND TEST EQUIPMENT REQUIREMENTS FOR MULTIPLEXER TD-1235(P)/TTC

TOOL OR TEST EQUIPMENT REF. CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/NATO STOCK NUMBER
02	H, D	TEST STATION, ELECTRONIC EQUIPMENT, AN/USM-410 (XE-3) WITH INTERFACE ADAPTERS	6625-00-614-9535
03	F, H, D	MULTIMETER DIGITAL AN/PSM-45**	6625-01-139-2512
04	H, D	DIGITAL CARD TESTER, AN/USM-465A WITH INTERFACE ADAPTERS	6625-01-126-2473
05	F, H, D	OSCILLOSCOPE, OS-261/U (TEK-475)	6625-00-127-0079
06	H, D	BENCH REPAIR FACILITY, PACE PRC-350C**	4940-00-031-4541
07	D	WIREWRAP TOOL, GARDNER DENVER, 14 x A2 W/SLEEVE, BIT AND UNWRAPPING TOOL FOR AWG 30 WIRE	---
08	D	CONTACT TOOL KIT	---
09	O, F, D	BITE CAPABILITY	---
10	O	TOOL KIT, ELECTRONIC EQUIPMENT, TK-101/G	5180-00-064-5178
11	H, F, D	TOOL KIT, ELECTRONIC EQUIPMENT, TK-105/G*	5180-00-610-8177
12	F, D	DIGITAL DATA GENERATOR, SG-1139( )/G	---
13	F, D	TRANSMISSION TEST SET HP-3551A	6625-01-062-0176
14	F	BREAKOUT TEST CABLES, G285555-1	
20	D	TIMING SOURCE SDG 210793	
30	F	SIGNAL GENERATOR, HP-8660C Opt. 001, 3	6625-01-003-7414
31	F	RF PLUG-IN, HP-86601A	6625-01-008-2166
32	F	AUXILIARY PLUG-IN, HP-86631B	6625-00-356-3172
33	F	PULSE GENERATOR, SG-1105, (HP-8013B)	6625-01-010-3524
43	D	TEST BREAKOUT BOX	
47	D	BREAKOUT TEST CABLES	
		*ITEM 11, ADDITIONAL HAND TOOLS REQUIRED, NOT SUPPLIED IN TK-105/G: SOCKET WRENCH SET	5120-00-542-5799
		**OR AIR FORCE EQUIVALENT	

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Section IV. REMARKS FOR MULTIPLEXER TD-1235(P)/TTC

REF CODE	TASK	REMARKS
		UNIT LEVEL MAINTENANCE TASKS (DETAILED)
A	INSPECT	VISUALLY INSPECT UNIT/ASSEMBLY FOR EXTERNAL DAMAGE, CRACKS, CORROSION, ETC. USE AUTHORIZED TOOL KIT (TK-101/G OR TK-105/G).
B	SERVICE	SERVICE EXTERIOR UNIT - CLEAN, DUST, AND REMOVE DIRT, GREASE, FUNGUS, ETC., AS NECESSARY.
C	REPAIR	USING TK-101/G TOOL KIT, REMOVE COVER ASSEMBLY. FAULT LOCATE BY OBSERVING EACH CCA FOR AN ILLUMINATED LED (BITE INDICATION). TEST EXTERNAL LAMP CIRCUITS. CHECK SWITCHES FOR PROPER INDICATION AND FREEDOM OF MOVEMENT. REPAIR OF UNIT LIMITED TO REPLACEMENT OF LAMP BULBS AS REQUIRED. REPLACEMENT OF CCAs IS ADDRESSED AT LOWER INDENT.
D	TEST	USING TK-105/G TOOL KIT, INTERNAL BITE AND AUTHORIZED TEST EQUIPMENT, PERFORM LOOPBACK TESTS, CHECK FRONT PANEL CONTROLS AND INDICATORS AND MAKE APPROPRIATE CONTINUITY CHECKS.
E	REPAIR	REPAIR OF UNIT LIMITED TO REAR CONNECTOR ASSEMBLY COMPONENTS, USING TK-105/G TOOL KIT, AND REPLACEMENT OF DEFECTIVE CCAs. AFTER REPAIR, TEST UNIT USING INTERNAL BITE AND AUTHORIZED TEST EQUIPMENT.
F	OVERHAUL	OVERHAUL OF UNIT AT DEPOT CONSISTS OF THE INSPECTION, TEST, AND REPAIR/REPLACEMENT OF CASE ASSEMBLY MOUNTED COMPONENTS AND CONNECTOR ASSEMBLY COMPONENTS AND THE REPLACEMENT OF ALL CIRCUIT CARD ASSEMBLIES. THE OVERHAUL OF THIS UNIT MAY USE ALL AUTHORIZED TOOLS AND TEST EQUIPMENT INDICATED ON THIS MAC.
G	REPAIR	USING AN/USM-410 TEST STATION OR AN/USM-465A CARD TESTER AS INDICATED, AN/PSM-45 DIGITAL MULTIMETER AND OS-261/U OSCILLOSCOPE, FAULT LOCATE/TROUBLESHOOT CCA. THEN USING TK-105/G TOOL KIT AND PRC-350C BENCH REPAIR FACILITY, REPAIR CCA REPLACING FAULTY COMPONENTS. TEST ITEM AFTER REPAIR. NOTE: PAINT STRIPPER, ISOPROPYL ALCOHOL AND EPOXY MAY BE USED AS REQUIRED TO STRIP, CLEAN AND TOUCH UP AFFECTED AREAS OF THE CCA.
H	TEST	USING AN/USM-410 TEST STATION OR AN/USM-465A CARD TESTER AS INDICATED, AN/PSM-45 DIGITAL MULTIMETER AND OS-261/U OSCILLOSCOPE, TEST CCA.

Section IV. REMARKS—Continued

REF CODE	TASK	REMARKS
		ORGANIZATIONAL MAINTENANCE TASKS (DETAILED)
OT1	INSPECT	USING TK-101/G TOOL KIT AS REQUIRED, VISUALLY INSPECT CCA OR ASSEMBLY FOR BITE INDICATION, DAMAGE, DEFECTS, CRACKS, CORROSION, ETC.
OT2	REPLACE	USING TK-101/G TOOL KIT, REMOVE COVER ASSEMBLY AS NECESSARY, THEN REMOVE AND REPLACE FAULTY CCAs OR ASSEMBLIES AS REQUIRED.
		DIRECT SUPPORT MAINTENANCE TASKS (DETAILED)
FT1	INSPECT	USING TK-105/G TOOL KIT AS NECESSARY, VISUALLY INSPECT ASSEMBLY FOR EXTERNAL DAMAGE, CRACKS, CORROSION, ETC.
FT2	TEST	USING TK-105/G TOOL KIT AND AN/PSM-45 DIGITAL MULTIMETER AS NECESSARY, TEST ASSEMBLY MAKING CONTINUITY AND SHORTS MEASUREMENTS. PERFORM INTERNAL BITE CHECKS AS APPLICABLE.
FT3	REPAIR	USING AN/PSM-45 DIGITAL MULTIMETER, FAULT LOCATE ASSEMBLY, MAKING CONTINUITY AND SHORTS MEASUREMENTS. USING TK-105/G TOOL KIT, REPLACE FRONT PANEL COMPONENTS OR CONNECTORS AS REQUIRED. NOTE: REAR CONNECTOR ASSEMBLY REPAIR IS LIMITED TO REPLACEMENT OF MECHANICAL COMPONENTS, (i.e., HANDLES, GASKET MATERIAL, FIELD WIRE POSTS AND COAX CONNECTORS WHERE APPLICABLE).
FT4	REPLACE	USING TK-105/G TOOL KIT, REPLACE ASSEMBLY AS REQUIRED.
		SRA MAINTENANCE TASKS (DETAILED)
HT1	INSPECT	USING TK-105/G TOOL KIT AS NECESSARY, VISUALLY INSPECT ASSEMBLY FOR EXTERNAL DAMAGE, CRACKS, CORROSION, ETC.
HT2	REPAIR	USING AN/USM-410 TEST STATION OR AN/USM-465A CARD TESTER AS INDICATED, AN/PSM-45 DIGITAL MULTIMETER AND OS-261/U OSCILLOSCOPE, FAULT LOCATE/TROUBLESHOOT CCA. THEN USING TK-105/G TOOL KIT AND PRC-350C BENCH REPAIR FACILITY, REPAIR CCA REPLACING FAULTY COMPONENTS. TEST ITEM AFTER REPAIR. NOTE: PAINT STRIPPER, ISOPROPYL ALCOHOL, AND EPOXY MAY BE USED AS REQUIRED TO STRIP, CLEAN, AND TOUCH UP AFFECTED AREAS OF THE CCA.
HT3	TEST	USING AN/USM-410 TEST STATION OR AN/USM-465A CARD TESTER AS INDICATED, AN/PSM-45 DIGITAL MULTIMETER AND OS-261/U OSCILLOSCOPE, TEST CCA.
		DEPOT MAINTENANCE TASKS (DETAILED)
DT1	INSPECT	USING TK-105/G TOOL KIT AS NECESSARY, VISUALLY INSPECT ASSEMBLY FOR EXTERNAL DAMAGE, CRACKS, CORROSION, ETC. (REFER TO DMWR.)
DT2	TEST	USING AN/PSM-45 DIGITAL MULTIMETER, TEST ASSEMBLY MAKING CONTINUITY AND SHORTS MEASUREMENTS. (REFER TO DMWR.)
DT3	REPAIR	USING TK-105/G TOOL KIT, WIREWRAP TOOL, CONTACT TOOL KIT, PRC-350C BENCH REPAIR FACILITY, AND AN/PSM-45 DIGITAL MULTIMETER AS REQUIRED, REPAIR ASSEMBLY AS NECESSARY. (REFER TO DMWR.)
DT4	REPAIR	USING AN/USM-410 TEST STATION OR AN/USM-465A CARD TESTER AS INDICATED, AN/PSM-45 DIGITAL MULTIMETER AND OS-261/U OSCILLOSCOPE, FAULT LOCATE/TROUBLESHOOT CCA. THEN USING TK-105/G TOOL KIT AND PRC-350C BENCH REPAIR FACILITY, REPAIR CCA REPLACING FAULTY COMPONENTS. TEST ITEM AFTER REPAIR. NOTE: PAINT STRIPPER, ISOPROPYL ALCOHOL, AND EPOXY MAY BE USED AS REQUIRED TO STRIP, CLEAN, AND TOUCH UP AFFECTED AREAS OF THE CCA.
DT5	TEST	USING AN/USM-410 TEST STATION OR AN/USM-465A CARD TESTER AS INDICATED, AN/PSM-45 DIGITAL MULTIMETER AND OS-261/U OSCILLOSCOPE, TEST CCA.

APPENDIX C
COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LIST

Section I. INTRODUCTION

C-1. SCOPE

This appendix lists components of end item and basic issue items for the LGM to help you inventory items required for safe and efficient operation.

C-2. GENERAL

The components of End Item List are divided into the following sections:

a. Section II. Components of End Item. This listing is for informational purposes only and is not authority to requisition replacements. These items are part of the end item that requires packaging for transportation or shipment. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. An illustration is furnished to assist you in identifying the items.

b. Section III. Basic Issue Items. These are the minimum essential items required to place the LGM in operation, to operate it, and to perform emergency repairs. Although shipped separately packaged, BII must be with the LGM during operation and whenever it is transferred between property accounts. The illustrations will assist you with hard-to-identify items. This manual is your authority to request/requisition replacement BII based on TOE/MTOE authorization of the end item.

C-3. EXPLANATION OF COLUMNS

The following provides an explanation of columns found in the tabular listings:

a. Column 1, Illustration Number (Illus Number). This column indicates the number of the illustration in which the item is shown.

b. Column 2, National Stock Number. Indicates the National Stock Number assigned to the item and will be used for requisitioning purposes.

c. Column 3, Description. Indicates the Federal item name and, if required, a minimum description to identify and locate the item. The last line for each item indicates the FSCM (in parentheses) followed by the part number.

C-3. EXPLANATION OF COLUMNS—Continued

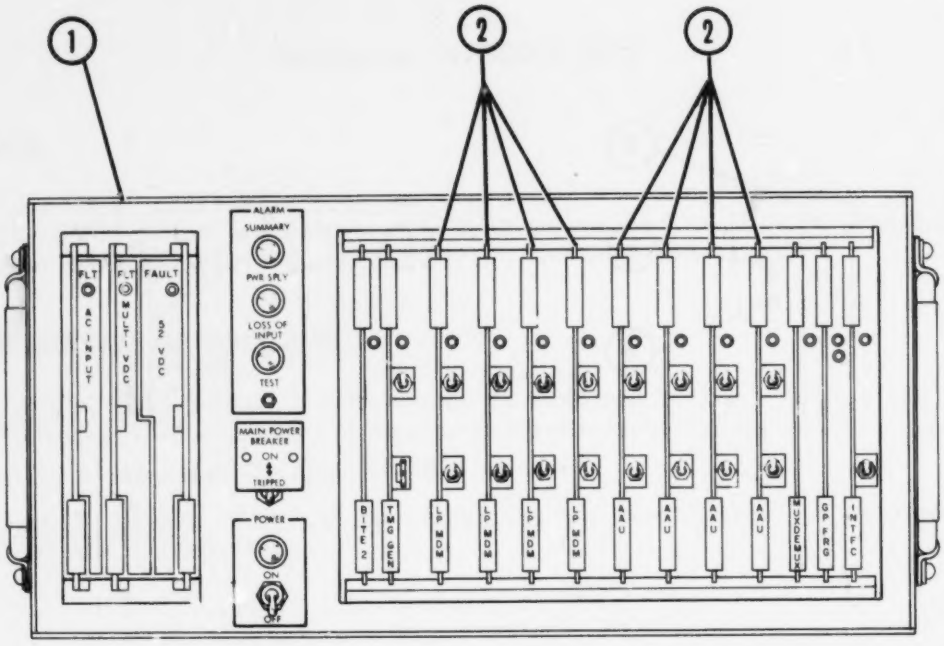
d. Column 4, Unit of Measure (U/M). Indicates the measure used in performing the actual operational/maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in., pr).

e. Column 5, Quantity Required (Qty Rqd). Indicates the quantity of the item authorized to be used with/on the equipment.

Section II. COMPONENTS OF END ITEM

This listing is for information purposes only and is not authority to requisition replacements. These items are part of the end item that requires packaging for transportation or shipment. (Depending upon the use of the equipment in a systems mode, the cards listed may be in various configurations. The types of cards and numbers may vary.) As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. An illustration is furnished to assist you in identifying the items.

Section II. COMPONENTS OF END ITEM —Continued

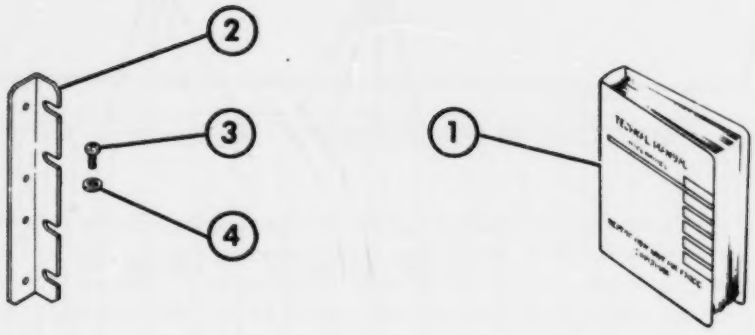


EL1US046

(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty Rqd
1	5820-01-145-2460	Multiplexer TD-1235(P)/TTC	Ea	1
2	5820-01-140-1314	Loop Modem CCA SM-D-986235	Ea	8*
	5820-01-140-1312	Analog Applique Unit CCA SM-D-959323	Ea	8*

*Quantity variable to the maximum indicated.

Section III. BASIC ISSUE ITEMS



EL1US045

(1) Illus Number	(2) National Stock Number	(3) Description FSCM and Part Number	(4) U/M	(5) Qty Rqd
1	N/A	Technical Manual TM 11-5805-696-12	Ea	1
2	N/A	Mounting Bracket	Ea	2
3	5305-00-059-3659	Mounting Screw	Ea	8
4	5310-00-619-1148	Flat Washer	Ea	8

APPENDIX E
EXPENDABLE SUPPLIES AND MATERIALS LIST

Section I. INTRODUCTION

E-1. SCOPE

This appendix lists expendable supplies and materials you will need to operate and maintain the LGM. These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraldic Items).

E-2. EXPLANATION OF COLUMNS

a. Column 1, Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "use cleaning cloth, item 2, Appendix E").

b. Column 2, Level. This column identifies the lowest level of maintenance that requires the listed item.

C ..... Operator or Crew
O ..... Organizational Maintenance
F ..... Direct Support Maintenance
H ..... General Support Maintenance

c. Column 3, National Stock Number. This is the National Stock Number assigned to the item; use it to request or requisition the item.

d. Column 4, Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the Federal Supply Code for Manufacturer (FSCM) in parentheses followed by the part number.

e. Column 5, Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in., pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) Item Number	(2) Level	(3) National Stock Number	(4) Description	(5) U/M
1	0	6850-00-105-3084	Cleaning compound, trichlorotrifluoroethane (80244) MIL-C-81302	Pt
2	0	8305-00-267-3015	Cheesecloth (81348) CCCC440	yd

GLOSSARY

Word	Meaning
Asynchronous	Data sources and control functions that are randomly time-related to each other.
Channel	Individual signals which are multiplexed to form a group.
Clock	A source of timing signals.
Conditioned Diphase	A waveform for data transmission designed for simple timing extraction.
Converter	A device used to change a signal from one form to another.
Data	Any or all facts, numbers, letters, symbols, or information that can be processed or produced by a computer.
Data Stream	All data transmitted through a path in a single input or output operation.
Demodulation	The process of removing the modulated carrier from the data.
Demultiplex	The process by which one data stream is separated into two or more independent signals.
Duplex	Simultaneous two way data flow.
Energize	To activate or turn on.
Faults	Error or indication that something is wrong with the equipment.
Frame	The array of bits between two frame bits.
Group	More than one channel combined into a single signal.
Malfunction	Error or indication that something is wrong with the equipment.
Modem	A modulation/demodulation device that: 1. Takes signals from sources such as multiplexers and generates waveforms suitable to the transmission medium. 2. Takes signals from the transmission medium and converts that to a form suitable for data processing in demultiplexers.

GLOSSARY—Continued

Word	Meaning
Modulation	The process of superimposing a data stream on a carrier for transmission purposes.
Multiplexer	A device used to combine two or more signals for transmission over a single channel.
Nonreturn to Zero	A signal having two states termed zero and one, and no neutral or reset condition.
Orderwire	A circuit used by maintenance to communicate between facilities.
Overhead	A space allocated in the frame period for the insertion of alarm signals and other local data.
Resync	The process of putting a signal back on a regular timing pattern.
Station Clock	A clock signal originating in the system.
Synchronous	Having a regular timing pattern.
Timing	A signal used to identify bits in a digital stream.

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TM 11-5840-340-12	23 Jan. 1974	Radar Set AN/PRC-76

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3-10	3-3		3-1
5-6	5-8		
		F03	

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

Recommend that the installation antenna alignment procedure be changed throughout to specify a 2° IFF antenna lag rather than 1°.

REASON: Experience has shown that with only a 1° lag, the antenna servo system is too sensitive to wind gusting in excess of 25 knots, and has a tendency to rapidly accelerate and decelerate as it hu[illegible], causing strain to the drive train. Hunting [illegible] minimized by adjusting the lag to 2° without [illegible] radat[illegible] of operation.

Item [illegible]ion column. Change "2 dB" to "3 dB."

REASON: The adj[illegible]nt procedure the TRANS POWER FAULT indicato[illegible] calls f[illegible] a 3 dB (500 watts) adjustment to light the TRA[illegible] POWER [illegible]LT indicator.

Add new step f.1 to read, "[illegible]place cover plate removed in step e.1, above."

REASON: To replace the cover plate.

Zone C 3. On J1-2, change "+24 VDC" to "+5 VDC."

REASON: This is the output line of the 5 VDC power supply. +24 VDC is the input voltage.

SAMPLE

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